

References

- [1] C. Hannachi, E. Moldovan, S. Boumaiza, and S. O. Tatu, "V-band multi-port waveguide direct-conversion receiver: Design and m-ary psk demodulation results," in *2018 18th International Symposium on Antenna Technology and Applied Electromagnetics (ANTEM)*, 2018, pp. 1-2.
- [2] S. Hong, S.-G. Kim, M. Coutant, C. Rodenbeck, and K. Chang, "A multiband, compact, and full-duplex beam scanning antenna transceiver system operating from 10 to 35 ghz," *IEEE Transactions on Antennas and Propagation*, vol. 54, no. 2, pp. 359-367, 2006.
- [3] Z. Li and K. Wu, "24ghz fmcw radar front-end system on substrate," in *2007 IEEE Radio and Wireless Symposium*, 2007, pp. 233-236.
- [4] M. Jiang, W. Hong, Y. Zhang, and H. Zhou, "A broadband waveguide to substrate integrated coaxial line (sicl) transition for w-band applications," in *2014 Asia-Pacific Microwave Conference*, Nov 2014, pp. 70-72.
- [5] M.-c. Tao, Y.-w. Wu, Z. Jiang, and Z.-c. Hao, "Ultra-wideband low-loss transition for the siw to the sicl," *IET Microwaves, Antennas & Propagation*, vol. 13, no. 11, pp. 1764-1767, 2019.
- [6] B. Liu, K. Xing, L. Wu, Z. Guo, X. Wei, Y. Ma, and R. Zhao, "A novel slot array antenna with a substrate-integrated coaxial line technique," *IEEE Antennas and Wireless Propagation Letters*, vol. 16, pp. 1743-1746, 2017.
- [7] F. Zhu, W. Hong, J. Chen, and K. Wu, "Ultra-wideband single and dual baluns based on substrate integrated coaxial line technology," *IEEE Transactions on Microwave Theory and Techniques*, vol. 60, no. 10, pp. 3062-3070, Oct 2012.
- [8] S. Mukherjee, "Design of substrate integrated coaxial line (sicl) fed dipole antenna for k band application," in *2017 IEEE Applied Electromagnetics Conference (AEMC)*, Dec 2017, pp. 1-2.
- [9] W. Liang and W. Hong, "Substrate integrated coaxial line 3 db coupler," *Electronics Letters*, vol. 48, no. 1, pp. 35-36, January 2012.
- [10] Q. Wu, H. Wang, C. Yu, X. Zhang, and W. Hong, "L/s-band dual-circularly polarized antenna fed by 3-db coupler," *IEEE Antennas and Wireless Propagation Letters*, vol. 14, pp. 426-429, 2015.
- [11] S. Jun-Yu, L. Qiang, W. Yong-Le, L. Yuan-An, L. Shu-Lan, Y. Cui-Ping, and L. Gan, "High-directivity single- and dual-band directional couplers based on substrate integrated coaxial line technology," in *2013 IEEE MTT-S International Microwave Symposium Digest (MTT)*, 2013, pp. 1-4.
- [12] Q. Liu, Y. Liu, Y. Wu, S. Li, C. Yu, and M. Su, "Broadband substrate integrated coaxial line to cbcpw transition for rat-race couplers and dual-band couplers design," *Progress In Electromagnetics Research C*, vol. 35, pp. 147-159, 2013.
- [13]
- [14] P. D. Coleman, "State of the art: Background and recent developments - millimeter and submillimeter waves," *IEEE Transactions on Microwave Theory and Techniques*, vol. 11, no. 5, pp. 271-288, September 1963.
- [15] T. S. Rappaport, S. Sun, R. Mayzus, H. Zhao, Y. Azar, K. Wang, G. N. Wong, J. K. Schulz, M. Samimi, and F. Gutierrez, "Millimeter wave mobile communications for 5g cellular: It will work!" *IEEE Access*, vol. 1, pp. 335-349, 2013.
- [16] A. M. Niknejad, "Siliconization of 60 ghz," *IEEE Microwave Magazine*, vol. 11, no. 1, pp. 78-85, Feb 2010.
- [17] L. Yujiri, M. Shoucri, and P. Moffa, "Passive millimeter wave imaging," *IEEE Microwave*

- Magazine*, vol. 4, no. 3, pp. 39–50, Sept 2003.
- [18] Y. Shao, X. Li, L. Wu, and J. Mao, “A wideband millimeter-wave substrate integrated coaxial line array for high-speed data transmission,” *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 8, pp. 2789–2800, Aug 2017.
- [19] D. Chakraborty, “Constraints in ku-band continental satellite network design,” *IEEE Communications Magazine*, vol. 24, no. 8, pp. 33–43, August 1986.
- [20] E. Garcia-Marin, J. L. Masa-Campos, and P. Sanchez-Olivares, “Planar array topologies for 5G communications in K_u band [wireless corner],” *IEEE Antennas and Prop. Mag.*, vol. 61, no. 2, pp. 112–133, April 2019.
- [21] J. Xu, W. Hong, H. Zhang, and H. Tang, “Compact bandpass filter with multiple coupling paths in limited space for ku-band application,” *IEEE Microwave and Wireless Components Letters*, vol. 27, no. 3, pp. 251–253, March 2017.
- [22] M. Shen, X. Q. Lin, and Z. He, “A wideband bandpass filter with multi-mode resonator and mixed electromagnetic coupling,” *Int. Journal of Microw. and Wireless Technol.*, vol. 9, no. 8, pp. 1653–1659, 2017.
- [23] M. Bozzi, A. Georgiadis, and K. Wu, “Review of substrate-integrated waveguide circuits and antennas,” *IET Microwaves, Antennas Propagation*, vol. 5, no. 8, pp. 909–920, June 2011.
- [24] X. Wei, X. Li, N. Wang, Y. Shao, and J. Mao, “A wide band millimeter-wave substrate integrated coaxial line (sicl) for high speed data transmission,” in *2015 Asia-Pacific Microwave Conference (APMC)*, vol. 3, Dec 2015, pp. 1–3.
- [25] Y. Shao, X. Li, and J. Mao, “A broadband transition from substrate integrated coaxial line to bga,” in *2018 International Conference on Microwave and Millimeter Wave Technology (ICMMT)*, May 2018, pp. 1–3.
- [26] I. S. Krishna and S. Mukherjee, “Design of wideband coaxial-to-substrate integrated coaxial line (sicl) planar transition,” in *2018 International Conference on Signal Processing and Communications (SPCOM)*, July 2018, pp. 152–156.
- [27] M. Cariou, B. Potelon, C. Quendo, S. Cadiou, E. Schlaffer, W. Pessl, and A. L. Fevre, “Compact x -band filter based on substrate integrated coaxial line stubs using advanced multilayer pcb technology,” *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 2, pp. 496–503, Feb 2017.
- [28] S. K. Idury and S. Mukherjee, “Design of a substrate integrated half mode coaxial cavity filter with multiple transmission zeros,” in *2019 49th European Microwave Conference (EuMC)*, Oct 2019, pp. 200–203.
- [29] B. Liu, Y. Ma, R. R. Zhao, W. Q. Xing, and Z. J. Guo, “A novel substrate-integrated coaxial line transverse slot array antenna,” *IEEE Transactions on Antennas and Propagation*, vol. 67, no. 9, pp. 6187–6192, Sep. 2019.
- [30] Z. Chen, W. Hong, J. Chen, and L. Li, “Design of a push-push and push-pull oscillator based on siw/sicl technique,” *IEEE Microwave and Wireless Components Letters*, vol. 24, no. 6, pp. 397–399, June 2014.
- [31] Q. Wu, H. Wang, C. Yu, X. Zhang, and W. Hong, “Dual-band sicl branch-line coupler,” *Microwave and Optical Technology Letters*, vol. 57, no. 5, pp. 1246–1249, 2015.
- [32] D. Deslandes and K. Wu, “Integrated microstrip and rectangular waveguide in planar form,” *IEEE Microwave and Wireless Components Letters*, vol. 11, no. 2, pp. 68–70, Feb 2001.
- [33] S. Mukherjee, P. Chongder, K. V. Srivastava, and A. Biswas, “Design of a broadband coaxial to substrate integrated waveguide (siw) transition,” in *2013 Asia-Pacific Microwave Conference Proceedings (APMC)*, Nov 2013, pp. 896–898.
- [34] A. Patrovsky, M. Daigle, and K. Wu, “Millimeter-wave wideband transition from cpw to substrate integrated waveguide on electrically thick high-permittivity substrates,” in *2007 European Microwave Conference*, Oct 2007, pp. 138–141.
- [35] T. Y. Yang, W. Hong, and Y. Zhang, “An sicl-excited wideband circularly polarized cavity-backed patch antenna for ieee 802.11aj (45 ghz) applications,” *IEEE Antennas and*

- Wireless Propagation Letters*, vol. 15, pp. 1265–1268, 2016.
- [36] Z. W. Miao and Z. C. Hao, "A wideband reflectarray antenna using substrate integrated coaxial true-time delay lines for q-link-pan applications," *IEEE Antennas and Wireless Propagation Letters*, vol. 16, pp. 2582–2585, 2017.
- [37] K. Xing, B. Liu, Z. Guo, X. Wei, R. Zhao, and Y. Ma, "Backlobe and sidelobe suppression of a q-band patch antenna array by using substrate integrated coaxial line feeding technique," *IEEE Antennas and Wireless Propagation Letters*, vol. 16, pp. 3043–3046, 2017.
- [38] L. Cheng, K. K. Fan, Z. C. Hao, and W. Hong, "Compact and wideband millimetre wave circularly polarised antenna array based on a sicl to waveguide transition," *IET Microwaves, Antennas Propagation*, vol. 11, no. 14, pp. 2097–2103, 2017.
- [39] L. Li, K. Ma, N. Yan, Y. Wang, and S. Mou, "A novel transition from substrate integrated suspended line to conductor backed cpw," *IEEE Microwave and Wireless Components Letters*, vol. 26, no. 6, pp. 389–391, 2016.
- [40] I. S. Krishna and S. Mukherjee, "Design of wideband coaxial-to-substrate integrated coaxial line (sicl) planar transition," in *2018 International Conference on Signal Processing and Communications (SPCOM)*, July 2018, pp. 152–156.
- [41] H. Du, X. Yu, H. Zhang, and P. Chen, "Design of broadband and dual-polarized dielectric-filled pyramidal horn antenna based on substrate-integrated waveguide," *Microwave and Optical Technology Letters*, vol. 61, no. 3, pp. 702–708, 2019. [Online]. Available: <https://onlinelibrary.wiley.com/doi/abs/10.1002/mop.31641>
- [42] Q. Liu, Y. Liu, Y. Wu, J.-Y. Shen, S. Li, C. Yu, and M. Su, "A substrate integrated waveguide to substrate integrated coaxial line transition," *Progress In Electromagnetics Research C*, vol. 36, pp. 249–259, 2013.
- [43] Z. He, C. J. You, S. Leng, and X. Li, "Compact inline substrate integrated waveguide filter with enhanced selectivity using new non-resonating node," *Electronics Letters*, vol. 52, no. 21, pp. 1778–1780, 2016.
- [44] W. A. Arriola, J. Y. Lee, and I. S. Kim, "Wideband 3 db branch line coupler based on $\lambda/4$ open circuited coupled lines," *IEEE Microwave and Wireless Components Letters*, vol. 21, no. 9, pp. 486–488, Sep. 2011.
- [45] M. A. Maktoomi, M. S. Hashmi, and F. M. Ghannouchi, "Theory and design of a novel wideband dc isolated wilkinson power divider," *IEEE Microwave and Wireless Components Letters*, vol. 26, no. 8, pp. 586–588, Aug 2016.
- [46] R. Gupta, A. Saxena, M. A. Maktoomi, and M. S. Hashmi, "An high impedance transformation ratio dual-band matching network with dc isolation capability," in *2017 IEEE Asia Pacific Microwave Conference (APMC)*, Nov 2017, pp. 1069–1072.
- [47] D. G. Kurup, A. Rydberg, and M. Himdi, "Compact microstrip-t coupled patch antenna for dual polarisation and active antenna applications," *Electronics Letters*, vol. 38, no. 21, pp. 1240–1241, Oct 2002.
- [48] D. G. Chen and K. W. Eccleston, "Substrate integrated waveguide with corrugated wall," in *2008 Asia-Pacific Microwave Conference*, Dec 2008, pp. 1–4.
- [49] M. Abdolhamidi and M. Shahabadi, "X-band substrate integrated waveguide amplifier," *IEEE Microwave and Wireless Components Letters*, vol. 18, no. 12, pp. 815–817, Dec 2008.
- [50] Lei Zhu and Ke Wu, "Accurate circuit model of interdigital capacitor and its application to design of new quasi-lumped miniaturized filters with suppression of harmonic resonance," *IEEE Transactions on Microwave Theory and Techniques*, vol. 48, no. 3, pp. 347–356, March 2000.
- [51] F. Gatti, M. Bozzi, L. Perregri, K. Wu, and R. G. Bosisio, "A novel substrate integrated coaxial line (sicl) for wide-band applications," in *2006 European Microwave Conference*, Sep. 2006, pp. 1614–1617.
- [52] G. Matthaei, L. Young, and E. Jones, "Microwave filters, impedance-matching networks, and coupling structures (artech microwave library)," *Artech House, February*, 1980.
- [53] I. Wolff, "Microstrip bandpass filter using degenerate modes of a microstrip ring resonator,"

Electronics Letters, vol. 8, no. 12, pp. 302–303, June 1972.

- [54] R. Zhang, L. Zhu, and S. Luo, "Dual-mode dual-band bandpass filter using a single slotted circular patch resonator," *IEEE Microwave and Wireless Components Letters*, vol. 22, no. 5, pp. 233–235, May 2012.
- [55] I. S. Krishna, R. K. Barik, and S. S. Karthikeyan, "A miniaturized wideband bandpass filter based on $3\lambda/4$ resonator loaded with stepped impedance," in *2017 Twenty-third National Conference on Communications (NCC)*, March 2017, pp. 1–5.
- [56] P. Chongder, S. Mukherjee, K. V. Srivastava, and A. Biswas, "Design of dual-mode substrate integrated hexagonal cavity (sihc) filter for x-band application," in *2013 Asia-Pacific Microwave Conference Proceedings (APMC)*, Nov 2013, pp. 942–944.
- [57] L. Yun-Long, D. Gao-Le, H. Changzhou, X. Gaoming, and L. Kai, "Design of miniaturized substrate integrated coaxial line bandpass filters with quarter-wavelength spiral resonator," *International Journal of RF and Microwave Computer-Aided Engineering*, vol. 26, no. 6, pp. 489–495, 2016.
- [58] Y. Lu, Y. Wang, T. Liu, B. Yu, and K. Li, "Miniaturized substrate-integrated coaxial line bandpass filter with improved upper stopband," *International Journal of Microwave and Wireless Technologies*, vol. 9, no. 7, p. 1441–1445, 2017.
- [59] P. Chu, W. Hong, L. Dai, H. Tang, Z. Hao, J. Chen, and K. Wu, "Wide stopband bandpass filter implemented with spur stepped impedance resonator and substrate integrated coaxial line technology," *IEEE Microwave and Wireless Components Letters*, vol. 24, no. 4, pp. 218–220, April 2014.
- [60] X. Li, C. J. You, Z. Shao, and Z. He, "A wideband bandpass filter based on stepped impedance stubs and substrate integrated coaxial line," in *2015 Asia-Pacific Microwave Conference (APMC)*, vol. 3, Dec 2015, pp. 1–3.
- [61] Z. Yan and S. Zhe, "A compact substrate integrated coaxial line bandpass filter with extended rejection bandwidth," *Microwave and Optical Technology Letters*, vol. 56, no. 2, pp. 415–418, 2014.
- [62] J. Mei, H. Wei, and Z. Yan, "Design and implementation of dual-band and triple-band substrate integrated coaxial line filters," *Microwave and Optical Technology Letters*, vol. 55, no. 11, pp. 2734–2738, 2013.
- [63] G. J. Cunningham, P. A. Blenkinsop, and J. H. Palmer, "Microstrip end-coupled filter design at mm-wave frequencies," in *1989 19th European Microwave Conference*, Sep. 1989, pp. 1210–1213.
- [64] T. Nishikawa, H. Tanaka, K. Utsumi, Y. Ishikawa, and K. Wakino, "28 ghz band bandpass filter using high q dielectric resonators," in *IEEE International Digest on Microwave Symposium*, May 1990, pp. 211–214 vol.1.
- [65] L. Wu, J. Mao, F. Hou, and J. Zhu, "Wideband filters on high-resistivity silicon substrate for 5g high-frequency applications," in *2017 IEEE Electrical Design of Advanced Packaging and Systems Symposium (EDAPS)*, Dec 2017, pp. 1–3.
- [66] S. Niranchanan, A. Shelkovnikov, and D. Budimir, "Novel millimetre wave metawaveguide resonators and filters," in *2007 European Microwave Conference*, Oct 2007, pp. 913–916.
- [67] M. Ali, F. Liu, A. Watanabe, P. M. Raj, V. Sundaram, M. M. Tentzeris, and R. R. Tummala, "First demonstration of compact, ultra-thin low-pass and bandpass filters for 5g small-cell applications," *IEEE Microwave and Wireless Components Letters*, vol. 28, no. 12, pp. 1110–1112, Dec 2018.
- [68] U. Rosenberg and S. Amari, "A novel band-reject element for pseudoelliptic bandstop filters," *IEEE Transactions on Microwave Theory and Techniques*, vol. 55, no. 4, pp. 742–746, April 2007.
- [69] D. Deslandes and K. Wu, "Single-substrate integration technique of planar circuits and waveguide filters," *IEEE Transactions on Microwave Theory and Techniques*, vol. 51, no. 2, pp. 593–596, Feb 2003.

- [70] M. Esmaeili, J. Bornemann, and P. Krauss, "Substrate integrated waveguide bandstop filter using partial-height via-hole resonators in thick substrate," *IET Microwaves, Antennas Propagation*, vol. 9, no. 12, pp. 1307–1312, 2015.
- [71] J. Showail, M. Lahti, K. Kari, E. Arabi, P. Rantakari, I. Huhtinen, T. Vaha-Heikkilä, and A. Shamim, "Siw cavity filters with embedded planar resonators in ltcc package for 5g applications," in *2018 48th European Microwave Conference (EuMC)*, Sep. 2018, pp. 757–760.
- [72] F. Parment, A. Ghiotto, T. Vuong, J. Duchamp, and K. Wu, "Low-loss air-filled substrate integrated waveguide (siw) band-pass filter with inductive posts," in *2015 European Microwave Conference (EuMC)*, Sep. 2015, pp. 761–764.
- [73] T. Shimizu, K. Goto, and Y. Kogami, "Development of a narrowband 30-ghz band bandpass filter with coaxial interfaces using coplanar type h-slot resonators," in *2018 48th European Microwave Conference (EuMC)*, Sep. 2018, pp. 745–748.
- [74] Chang-Ho Lee, A. Sutono, Sangwoo Han, Kyutae Lim, S. Pinel, E. M. Tentzeris, and J. Laskar, "A compact ltcc-based ku-band transmitter module," *IEEE Transactions on Advanced Packaging*, vol. 25, no. 3, pp. 374–384, Aug 2002.
- [75] B. Potelon, J. Favennec, C. Quendo, E. Rius, C. Person, and J. Bohorquez, "Design of a substrate integrated waveguide (siw) filter using a novel topology of coupling," *IEEE Microwave and Wireless Components Letters*, vol. 18, no. 9, pp. 596–598, Sep. 2008.
- [76] R. Li and X. Tang, "Substrate integrated waveguide dual-mode filter using slot lines perturbation," *IET Electronics Letters*, vol. 46, no. 12, pp. 845–846, June 2010.
- [77] P. Chongder, K. V. Srivastava, and A. Biswas, "Realisation of controllable transmission zeros by perturbation technique for designing dual-mode filter using substrate integrated hexagonal cavity," *IET Microwaves, Antennas Propagation*, vol. 8, no. 6, pp. 451–457, April 2014.
- [78] M. Sagawa, M. Makimoto, and S. Yamashita, "Geometrical structures and fundamental characteristics of microwave stepped-impedance resonators," *IEEE Transactions on Microwave Theory and Techniques*, vol. 45, no. 7, pp. 1078–1085, July 1997.
- [79] A. L. Borja, A. Belenguer, H. Esteban, and V. E. Boria, "Design and performance of a high- q narrow bandwidth bandpass filter in empty substrate integrated coaxial line at k_u -band," *IEEE Microwave and Wireless Components Letters*, vol. 27, no. 11, pp. 977–979, Nov 2017.
- [80] J.-S. G. Hong and M. J. Lancaster, *Microstrip filters for RF/microwave applications*. John Wiley & Sons, 2004, vol. 167.
- [81] R. S. Malfajani and Z. Atlasbaf, "Design and implementation of a dual-band single layer reflectarray in X and K bands," *IEEE Transactions on Antennas and Propagation*, vol. 62, no. 8, pp. 4425–4431, 2014.
- [82] U. Naeem, S. Bila, M. Thévenot, T. Monédière, and S. Verdeyme, "A dual-band bandpass filter with widely separated passbands," *IEEE Transactions on Microwave Theory and Techniques*, vol. 62, no. 3, pp. 450–456, 2014.
- [83] U. Naeem, A. Périgaud, and S. Bila, "Dual-mode dual-band bandpass cavity filters with widely separated passbands," *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 8, pp. 2681–2686, 2017.
- [84] X. Chen, K. Wu, and D. Drolet, "Substrate integrated waveguide filter with improved stopband performance for satellite ground terminal," *IEEE Transactions on Microwave Theory and Techniques*, vol. 57, no. 3, pp. 674–683, 2009.
- [85] K. Zhou and C. Zhou and W. Wu, "Resonance characteristics of substrate-integrated rectangular cavity and their applications to dual-band and wide-stopband bandpass filters design," *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 5, pp. 1511–1524, 2017.
- [86] K. Zhou and C. Zhou and W. Wu, "Substrate-integrated waveguide dual-mode dual-band bandpass filters with widely controllable bandwidth ratios," *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 10, pp. 3801–3812, 2017.

- [87] K. Dhvaj, X. Li, Z. Shen, and S. Qin, "Cavity resonators do the trick: A packaged substrate integrated waveguide, dual-band filter," *IEEE Microwave Magazine*, vol. 17, no. 1, pp. 58–64, 2016.
- [88] K. Zhou and C. Zhou and W. Wu, "Dual-mode characteristics of half-mode SIW rectangular cavity and applications to dual-band filters with widely separated passbands," *IEEE Transactions on Microwave Theory and Techniques*, vol. 66, no. 11, pp. 4820–4829, 2018.
- [89] S. Moscato, C. Tomassoni, M. Bozzi, and L. Perregrini, "Quarter-mode cavity filters in substrate integrated waveguide technology," *IEEE Transactions on Microwave Theory and Techniques*, vol. 64, no. 8, pp. 2538–2547, 2016.
- [90] I. S. Krishna and S. Mukherjee, "Design of wideband microstrip to SICL transition for millimeter-wave applications," *IEEE Access*, vol. 8, pp. 4250–4254, 2020.
- [91] I. S. Krishna and S. Mukherjee, "SICL-based wideband crossover with low phase imbalance and group delay," *IET Microwaves, Antennas & Propagation*, vol. 14, no. 12, pp. 1355–1360, October 2020.
- [92] I. S. Krishna and S. Mukherjee, "Dual-mode SICL bandpass filter with via based perturbation technique for K_u -band," *Electronics Lett.*, vol. 56, no. 18, pp. 934–937, 2020.
- [93] — —, "Design of dual-mode substrate integrated coaxial line (SICL) cavity filter for millimeter-wave applications," in *2018 IEEE MTT-S International Microwave and RF Conference (IMaRC)*, 2018, pp. 1–4.
- [94] N. Baghel and S. Mukherjee, "Slot antenna excited by novel substrate integrated coaxial line cavity for millimetre wave application," *Electronics Letters*, vol. 56, no. 7, pp. 317–319, March 2020.
- [95] M. Yuceer, "A reconfigurable microwave combline filter," *IEEE Trans. Circuits and Syst. II: Exp. Briefs*, vol. 63, no. 1, pp. 84–88, Jan 2016.
- [96] D. K. Choudhary and R. K. Chaudhary, "Compact lowpass and dual-band bandpass filter with controllable transmission zero/center frequencies/passband bandwidth," *IEEE Trans. Circuits and Syst. II: Exp. Briefs*, pp. 1–1, 2019.
- [97] G. Shen, W. Che, W. Feng, and C. Wang, "Realization of multiple transmission zeroes for bandpass filters with simple inline topology," *IEEE Trans. Circuits and Syst. II: Exp. Briefs*, pp. 1–1, 2019.
- [98] M. Shen, Z. Shao, and F. You, Chang Jiang & Ban, " k_u -band compact bandpass filter with wide upper stopband using multilayer liquid crystal polymer technology," *Microw. Opt. Tech. Lett.*, vol. 57, no. 5, pp. 1121–1125, 2015.
- [99] D. Diedhiou, E. Rius, J. Favennec, and A. E. Mostrah, "Ku-band cross-coupled ceramic SIW filter using a novel electric cross-coupling," *IEEE Microw. Wireless Compon. Lett.*, vol. 25, no. 2, pp. 109–111, Feb 2015.
- [100] D. Jia, Q. Feng, Q. Xiang, and K. Wu, "Multilayer substrate integrated waveguide (SIW) filters with higher-order mode suppression," *IEEE Microw. Wireless Compon. Lett.*, vol. 26, no. 9, pp. 678–680, Sep. 2016.
- [101] Q. Liu, D. Zhou, J. Shi, and T. Hu, "High-selective triple-mode SIW bandpass filter using higher-order resonant modes," *Electronics Letters*, vol. 56, no. 1, pp. 37–39, 2020.
- [102] M. Esmaeili, J. Bornemann, and P. Krauss, "Substrate integrated waveguide bandstop filter using partial-height via-hole resonators in thick substrate," *IET Microw. Antennas Propag.*, vol. 9, no. 12, pp. 1307–1312, 2015.
- [103] Y. Zhang and Z. Song, "A compact substrate integrated coaxial line bandpass filter with extended rejection bandwidth," *Microwave and Optical Technology Letters*, vol. 56, no. 2, pp. 415–418, 2014.
- [104] H. W. Johnson and M. Graham, *High-speed digital design: a handbook of black magic*. Prentice Hall Englewood Cliffs, NJ, 1993, vol. 155.
- [105] J.-S. G. Hong and M. J. Lancaster, *Microstrip filters for RF/microwave applications*. John Wiley & Sons, 2004, vol. 167.

- [106] W. R. Eisenstadt and Y. Eo, "S-parameter-based IC interconnect transmission line characterization," *IEEE Trans. on Comp, Hybrids, Manuf Techn.*, vol. 15, no. 4, pp. 483–490, 1992.
- [107] J. D. Martinez, S. Sirci, M. Taroncher, and V. E. Boria, "Compact CPW fed combline filter in substrate integrated waveguide technology," *IEEE Microw. Wireless Compon. Lett.*, vol. 22, no. 1, pp. 7–9, Jan 2012.
- [108] S. Sirci, M. . Sánchez-Soriano, J. D. Martínez, V. E. Boria, F. Gentili, W. Bösch, and R. Sorrentino, "Design and multiphysics analysis of direct and cross-coupled SIW combline filters using electric and magnetic couplings," *IEEE Trans. Microw. Theory Techn.*, vol. 63, no. 12, pp. 4341–4354, Dec 2015.
- [109] M. . Sánchez-Soriano, S. Sirci, J. D. Martínez, and V. E. Boria, "Compact dual-mode substrate integrated waveguide coaxial cavity for bandpass filter design," *IEEE Microw. Wireless Compon. Lett.*, vol. 26, no. 6, pp. 386–388, June 2016.
- [110] C. A. Balanis, *Antenna Theory: Analysis and Design*. Wiley-Interscience, 2005.
- [111] M. Bemani, S. Nikmehr, and H. R. Takfallah, "Dual-band microstrip-to-coplanar stripline wilkinson balun using composite right- and left-handed transmission lines and its application in feeding dual-band bow-tie antenna," *IET Microwaves, Antennas Propagation*, vol. 8, no. 7, pp. 532–540, May 2014.
- [112] J. Venkatesan, "Novel version of the double-y balun: Microstrip to coplanar strip transition," *IEEE Antennas and Wireless Propagation Letters*, vol. 5, pp. 172–174, 2006.
- [113] J. Schellenberg and H. Do-Ky, "Low-loss, planar monolithic baluns for k/ka-band applications," in *1999 IEEE MTT-S International Microwave Symposium Digest (Cat. No.99CH36282)*, vol. 4, June 1999, pp. 1733–1736 vol.4.
- [114] M. Caillet, M. Clenet, A. Sharaiha, and Y. M. M. Antar, "A compact wide-band rat-race hybrid using microstrip lines," *IEEE Microwave and Wireless Components Letters*, vol. 19, no. 4, pp. 191–193, April 2009.
- [115] T. Zhang and V. Subramanian, "Design and integration of compact k-band baluns using impedance tuning approach," *Progress In Electromagnetics Research*, vol. 27, pp. 1–13, 2012.
- [116] A. K. Poddar, U. L. Rohde, V. Madhavan, and S. K. Koul, "A novel uwb balun: Application in 5g systems," in *2016 IEEE International Frequency Control Symposium (IFCS)*, May 2016, pp. 1–7.
- [117] Z. Y. Zhang and K. Wu, "A broadband substrate integrated waveguide (siw) planar balun," *IEEE Microwave and Wireless Components Letters*, vol. 17, no. 12, pp. 843–845, Dec 2007.
- [118] J. Guo, J. Xu, Y. Chen, and C. Qian, "Design of a millimeter-wave third-harmonic mixer using substrate integrated waveguide balun," *IEICE Electronics Express*, vol. 14, no. 21, pp. 20170980–20170980, 2017.
- [119] H. Zhang-Cheng, D. Wen-Qi, and H. Xin-Ping, "A wideband high selectivity filtering balun," *Microwave and Optical Technology Letters*, vol. 57, no. 5, pp. 1107–1110, 2015.
- [120] "Spectrum for 4g and 5g. (dec. 2017). white paper." [Online]. Available: <https://www.qualcomm.com/media/documents/files/spectrum-for-4g-and-5g.pdf>
- [121] Y. Li, C. Y. D. Sim, Y. Luo, and G. Yang, "12-port 5g massive mimo antenna array in sub-6ghz mobile handset for lte bands 42/43/46 applications," *IEEE Access*, vol. 6, pp. 344–354, 2018.
- [122] H. Zhang and H. Xin, "Stepped-impedance based dual-band and dual-function balun for 20 / 44 ghz applications," in *2009 3rd European Conference on Antennas and Propagation*, March 2009, pp. 2595–2598.
- [123] H. Bex, "New broadband balun," *Electronics Letters*, vol. 11, no. 2, pp. 47–48, January 1975.
- [124] H. Zhang and K. J. Chen, "A stub tapped branch-line coupler for dual-band operations," *IEEE Microwave and Wireless Components Letters*, vol. 17, no. 2, pp. 106–108, Feb 2007.
- [125] D. M. Pozar, *Microwave Engineering*. John Wiley & Sons, 2009.
- [126] Y. J. Cheng, W. Hong, K. Wu, and Y. Fan, "A hybrid guided-wave structure of half mode substrate integrated waveguide and conductor-backed slotline and its application in

- directional couplers," *IEEE Microwave and Wireless Components Letters*, vol. 21, no. 2, pp. 65–67, Feb 2011.
- [127] G. H. Zhai, W. Hong, K. Wu, J. X. Chen, P. Chen, J. Wei, and H. J. Tang, "Folded half mode substrate integrated waveguide 3 db coupler," *IEEE Microwave and Wireless Components Letters*, vol. 18, no. 8, pp. 512–514, Aug 2008.
- [128] Z. Chen, W. Hong, and J. Chen, "Low cost octave directional coupler based on substrate integrated coaxial line (sicl) technique," in *2012 Asia Pacific Microwave Conference Proceedings*, Dec 2012, pp. 1208–1210.
- [129] I. S. Krishna and S. Mukherjee, "A substrate integrated coaxial line dual-band balun for 5G applications," in *2018 Asia-Pacific Microwave Conference (APMC)*, Nov 2018, pp. 1190–1192.
- [130] D. M. Pozar, *Microwave Engineering*. John Wiley & Sons, 2011.
- [131] K.-K. M. Cheng and S. Yeung, "A novel rat-race coupler with tunable power dividing ratio, ideal port isolation, and return loss performance," *IEEE Transactions on Microwave Theory and Techniques*, vol. 61, no. 1, pp. 55–60, 2013.
- [132] W. Feng, W. Che, Y. Shi, R. Gómez-García, C. Wang, Q. Xue, X. Y. Zhang, and X. Y. Zhou, "Balanced rat-race couplers with wideband common-mode suppression," *IEEE Transactions on Microwave Theory and Techniques*, vol. 67, no. 12, pp. 4724–4732, 2019.
- [133] X. Tan and F. Lin, "A novel rat-race coupler with widely tunable frequency," *IEEE Transactions on Microwave Theory and Techniques*, vol. 67, no. 3, pp. 957–967, 2019.
- [134] X. Zhu, T. Yang, P.-L. Chi, and R. Xu, "Novel reconfigurable filtering rat-race coupler, branch-line coupler, and multiorder bandpass filter with frequency, bandwidth, and power division ratio control," *IEEE Transactions on Microwave Theory and Techniques*, vol. 68, no. 4, pp. 1496–1509, 2020.
- [135] I.-H. Lin, M. DeVincentis, C. Caloz, and T. Itoh, "Arbitrary dual-band components using composite right/left-handed transmission lines," *IEEE Transactions on Microwave Theory and Techniques*, vol. 52, no. 4, pp. 1142–1149, 2004.
- [136] C. P. Kong and K.-k. M. Cheng, "Dual-band rat-race coupler with bandwidth enhancement," in *2006 IEEE MTT-S International Microwave Symposium Digest*, 2006, pp. 1559–1562.
- [137] H.-x. Xu, G.-m. Wang, and K. Lu, "Microstrip rat-race couplers," *IEEE Microwave Magazine*, vol. 12, no. 4, pp. 117–129, 2011.
- [138] Z.-Y. Zhang, Y. R. Wei, and K. Wu, "Broadband millimeter-wave single balanced mixer and its applications to substrate integrated wireless systems," *IEEE Transactions on Microwave Theory and Techniques*, vol. 60, no. 3, pp. 660–669, 2012.
- [139] H.-Y. Li, J.-X. Xu, and X. Y. Zhang, "Substrate integrated waveguide filtering rat-race coupler based on orthogonal degenerate modes," *IEEE Transactions on Microwave Theory and Techniques*, vol. 67, no. 1, pp. 140–150, 2019.
- [140] T.-M. Shen, C.-R. Chen, T.-Y. Huang, and R.-B. Wu, "Dual-band rat-race coupler design in multilayer ltcc," in *2010 Asia-Pacific Microwave Conference*, 2010, pp. 798–801.
- [141] C.-H. Tseng, C.-H. Mou, C.-C. Lin, and C.-H. Chao, "Design of microwave dual-band rat-race couplers in printed-circuit board and gipd technologies," *IEEE Transactions on Components, Packaging and Manufacturing Technology*, vol. 6, no. 2, pp. 262–271, 2016.
- [142] Tzyy-Sheng Horng, "A rigorous study of microstrip crossovers and their possible improvements," *IEEE Transactions on Microwave Theory and Techniques*, vol. 42, no. 9, pp. 1802–1806, Sep. 1994.
- [143] H. . Yang and N. G. Alexopoulos, "Basic blocks for high-frequency interconnects: theory and experiment," *IEEE Transactions on Microwave Theory and Techniques*, vol. 36, no. 8, pp. 1258–1264, Aug 1988.
- [144] J. S. Wight, W. J. Chudobiak, and V. Makios, "A microstrip and stripline crossover structure (letters)," *IEEE Transactions on Microwave Theory and Techniques*, vol. 24, no. 5, pp. 270–270, May 1976.
- [145] J. Yao, C. Lee, and S. P. Yeo, "Microstrip branch-line couplers for crossover application,"

- IEEE Transactions on Microwave Theory and Techniques*, vol. 59, no. 1, pp. 87–92, Jan 2011.
- [146] C. Tang, K. Lin, and W. Chen, “Analysis and design of compact and wide-passband planar crossovers,” *IEEE Transactions on Microwave Theory and Techniques*, vol. 62, no. 12, pp. 2975–2982, Dec 2014.
- [147] H. Zhu, Y. Wang, and A. M. Abbosh, “Broadband microwave crossover using parallel-coupled microstrip lines and short-ended stubs,” *IET Microwaves, Antennas Propagation*, vol. 9, no. 1, pp. 79–85, 2015.
- [148] W. Liu, Z. Zhang, Z. Feng, and M. F. Iskander, “A compact wideband microstrip crossover,” *IEEE Microwave and Wireless Components Letters*, vol. 22, no. 5, pp. 254–256, May 2012.
- [149] A. M. Abbosh, “Wideband planar crossover using two-port and four-port microstrip to slotline transitions,” *IEEE Microwave and Wireless Components Letters*, vol. 22, no. 9, pp. 465–467, Sep. 2012.
- [150] D. Packiaraj, K. J. Vinoy, P. Nagarajarao, M. Ramesh, and A. T. Kalghatgi, “Miniaturized defected ground high isolation crossovers,” *IEEE Microwave and Wireless Components Letters*, vol. 23, no. 7, pp. 347–349, July 2013.
- [151] A. Abbosh, S. Ibrahim, and M. Karim, “Ultra-wideband crossover using microstrip-to-coplanar waveguide transitions,” *IEEE Microwave and Wireless Components Letters*, vol. 22, no. 10, pp. 500–502, Oct 2012.
- [152] S. Y. Eom, A. Batgerel, and L. Minz, “Compact broadband microstrip crossover with isolation improvement and phase compensation,” *IEEE Microwave and Wireless Components Letters*, vol. 24, no. 7, pp. 481–483, July 2014.
- [153] Y. Wang, A. M. Abbosh, and B. Henin, “Broadband microwave crossover using combination of ring resonator and circular microstrip patch,” *IEEE Transactions on Components, Packaging and Manufacturing Technology*, vol. 3, no. 10, pp. 1771–1777, Oct 2013.
- [154] A. M. Abbosh, “Planar wideband crossover with distortionless response using dual-mode microstrip patch,” *Microwave and Optical Technology Letters*, vol. 54, no. 9, pp. 2077–2079, 2012.
- [155] B. Henin and A. M. Abbosh, “Compact planar microstrip crossover for beamforming networks,” *Progress In Electromagnetics Research*, vol. 33, pp. 123–132, 2012.
- [156] B. Henin and A. Abbosh, “Design of compact planar crossover using sierpinski carpet microstrip patch,” *IET Microwaves, Antennas Propagation*, vol. 7, no. 1, pp. 54–60, January 2013.
- [157] T. Djerafi, N. J. G. Fonseca, and K. Wu, “Design and implementation of a planar 4×4 butler matrix in siw technology for wideband applications,” in *The 40th European Microwave Conference*, Sep. 2010, pp. 910–913.
- [158] S. Y. Zheng and X. F. Ye, “Ultra-compact wideband millimeter-wave crossover using slotted siw structure,” in *2016 IEEE International Workshop on Electromagnetics: Applications and Student Innovation Competition (iWEM)*, May 2016, pp. 1–2.
- [159] M. Pajovic, J. Yu, and D. Milojkovic, “Analysis of via capacitance in arbitrary multilayer pcbs,” *IEEE Transactions on Electromagnetic Compatibility*, vol. 49, no. 3, pp. 722–726, Aug 2007.
- [160] H. W. Johnson, M. Graham *et al.*, *High-speed digital design: a handbook of black magic*. Prentice Hall Upper Saddle River, NJ, 1993, vol. 155.
- [161] A. E. Ruehli, “Inductance calculations in a complex integrated circuit environment,” *IBM Journal of Research and Development*, vol. 16, no. 5, pp. 470–481, Sep. 1972.
- [162] A. B. Guntupalli, T. Djerafi, and K. Wu, “Ultra-compact millimeter-wave substrate integrated waveguide crossover structure utilizing simultaneous electric and magnetic coupling,” in *2012 IEEE/MTT-S International Microwave Symposium Digest*, June 2012, pp. 1–3.
- [163] K. Wincza, S. Gruszczynski, and K. Sachse, “Improved multilayer transmission-line crossover for butler matrix applications,” in *2006 International Conference on Microwaves, Radar Wireless Communications*, May 2006, pp. 637–640.

- [164] M. Nedil, A. M. Habib, and T. A. Denidni, "Novel ultra-wideband cb-cbw butler matrix," in *2008 IEEE Antennas and Propagation Society International Symposium*, July 2008, pp. 1–4.
- [165] M. Traii, M. Nedil, A. Gharsallah, and T. A. Denidni, "A novel wideband butler matrix using multi-layer technology," *Microwave and Optical Technology Letters*, vol. 51, no. 3, pp. 659–663, 2009. [Online]. Available: <https://onlinelibrary.wiley.com/doi/abs/10.1002/mop.24116>
- [166] M. L. Seddiki, F. Ghanem, M. Nedil, and A. Bouklif, "Compact crossover on multilayer substrate for uwb applications," *Electronics Letters*, vol. 53, no. 3, pp. 162–163, 2017.
- [167] Y. J. Sung, "Microstrip resonator doubling as a filter and as an antenna," *IEEE Antennas Wireless Propag. Lett.*, vol. 9, pp. 467–470, 2010.
- [168] K.-Z. Hu, M.-C. Tang, M. Li, and R. W. Ziolkowski, "Compact, low-profile, bandwidth-enhanced substrate integrated waveguide filtenna," *IEEE Antennas Wireless Propag. Lett.*, vol. 17, no. 8, pp. 1552–1556, 2018.
- [169] M. Adhikary, A. Sarkar, A. Sharma, A. Biswas, and M. J. Akhtar, "Miniaturized SIW filter antenna with loadable sensor for various microwave sensing applications," in *2017 IEEE International Symposium on Antennas and Propagation USNC/URSI National Radio Science Meeting*, 2017, pp. 2505–2506.
- [170] A. Suntives and R. Abhari, "Ultra-high-speed multichannel data transmission using hybrid substrate integrated waveguides," *IEEE Transactions on Microwave Theory and Techniques*, vol. 56, no. 8, pp. 1973–1984, 2008.
- [171] H. Ren, M. Zhou, Y. Gu, and B. Arigong, "A tunable transmission line with controllable phase shifting and characteristic impedance," *IEEE Transactions on Circuits and Systems II: Express Briefs*, vol. 67, no. 10, pp. 1720–1724, 2020.
- [172] I. S. Krishna and S. Mukherjee, "Triple-mode substrate integrated coaxial resonator based bandpass filter featuring flexible transmission zeros and adjustable bandwidth," *IEEE Transactions on Circuits and Systems II: Express Briefs*, vol. 68, no. 4, pp. 1223–1227, 2021.
- [173] T.-S. Chen, "Determination of the capacitance, inductance, and characteristic impedance of rectangular lines," *IRE Transactions on Microwave Theory and Techniques*, vol. 8, no. 5, pp. 510–519, 1960.
- [174] Q. Wu, W. Wei, H. Wang, C. Yu, and W. Hong, "Approximate sicl synthesis method," in *2015 Asia-Pacific Microwave Conference (APMC)*, vol. 1, 2015, pp. 1–3.
- [175] X. Li, Y. Shao, N. Wang, B. Yuan, and J. MaMao, "Substrate integrated coaxial line wave guide interconnection array structure," Aug. 9 2018, uS Patent App. 15/749,505.
- [176] A. Li and K.-m. Luk, "Ultra-wideband endfire long-slot-excited phased array for millimeter-wave applications," *IEEE Transactions on Antennas and Propagation*, vol. 69, no. 6, pp. 3284–3293, 2021.
- [177] A. Li and K.-M. Luk, "Millimeter-wave end-fire magneto-electric dipole antenna and arrays with asymmetrical substrate integrated coaxial line feed," *IEEE Open Journal of Antennas and Propagation*, vol. 2, pp. 62–71, 2021.
- [178] F. Xu and K. Wu, "Guided-wave and leakage characteristics of substrate integrated waveguide," *IEEE Transactions on Microwave Theory and Techniques*, vol. 53, no. 1, pp. 66–73, 2005.
- [179] L. Cheng, K.-K. Fan, Z.-C. Hao, and W. Hong, "Compact and wideband millimetre wave circularly polarised antenna array based on a sicl to waveguide transition," *IET Microwaves, Antennas & Propagation*, vol. 11, no. 14, pp. 2097–2103, 2017.
- [180] X. Wang, L. Kong, F. Kong, F. Qiu, M. Xia, S. Arnon, and G. Chen, "Millimeter wave communication: A comprehensive survey," *IEEE Communications Surveys Tutorials*, vol. 20, no. 3, pp. 1616–1653, thirdquarter 2018.
- [181] Y. Cassivi, L. Perregrini, K. Wu, and G. Conciauro, "Low-cost and high-q millimeter-wave resonator using substrate integrated waveguide technique," in *2002 32nd European Microwave Conference*, 2002, pp. 1–4.
- [182] Y. Wang, W. Hong, Y. Dong, B. Liu, H. J. Tang, J. Chen, X. Yin, and K. Wu, "Half

- mode substrate integrated waveguide (hmsiw) bandpass filter," *IEEE Microwave and Wireless Components Letters*, vol. 17, no. 4, pp. 265–267, 2007.
- [183] X. Wang, X. Zhu, Z. H. Jiang, Z. Hao, Y. Wu, and W. Hong, "Analysis of eighth-mode substrate-integrated waveguide cavity and flexible filter design," *IEEE Transactions on Microwave Theory and Techniques*, vol. 67, no. 7, pp. 2701–2712, 2019.
- [184] S. Gao, Z.-Y. Xiao, and W.-F. Chen, "Dual-band bandpass filter with source-load coupling," *Electronics Letters*, vol. 45, pp. 894–895(1), August 2009.
- [185] B. Lacroix and J. Papapolymerou, "A triple-mode x-band microstrip ring resonator filter," in *2011 IEEE MTT-S International Microwave Symposium*, 2011, pp. 1–4.
- [186] L. Qing, Z. Dongfang, L. Dalong, Z. Dewei, Z. Junjie, and Z. Yi, "Multi-layered dual-mode substrate integrated waveguide bandpass filter with input and output ports located on same substrate layer," *IET Microwaves, Antennas & Propagation*, vol. 13, pp. 2641–2648(7), December 2019.
- [187] D. Jia, J. Deng, Y. Zhao, and K. Wu, "Multilayer siw dual-band filters with independent band characteristics and high selectivity," *Frequenz*, vol. 73, no. 9-10, pp. 293–300, 2019. [Online]. Available: <https://doi.org/10.1515/freq-2019-0024>
- [188] K. Wang, S. W. Wong, L. Zhu, Q. Zhang, and Q.-X. Chu, "A novel siw dual-band bandpass filter on a double-layer substrate using loaded posts," *Microwave and Optical Technology Letters*, vol. 58, no. 1, pp. 155–158, 2016.
- [189] E. Ofli, R. Vahldieck, and S. Amari, "Novel e-plane filters and diplexers with elliptic response for millimeter-wave applications," *IEEE Transactions on Microwave Theory and Techniques*, vol. 53, no. 3, pp. 843–851, 2005.
- [190] M.-L. Chuang and M.-T. Wu, "Microstrip diplexer design using common t-shaped resonator," *IEEE Microwave and Wireless Components Letters*, vol. 21, no. 11, pp. 583–585, 2011.
- [191] X. Guan, F. Yang, H. Liu, and L. Zhu, "Compact and high-isolation diplexer using dual-mode stub-loaded resonators," *IEEE Microwave and Wireless Components Letters*, vol. 24, no. 6, pp. 385–387, 2014.
- [192] K. Yavuz Kapusuz, G. Ollivier, J. Noppe, J. Van Maele, S. Lemey, and H. Rogier, "Substrate-integrated-waveguide diplexer filter for satcom-on-the-move," in *2021 IEEE MTT-S International Microwave Filter Workshop (IMFW)*, 2021, pp. 56–58.
- [193] T. Skaik, Y. Yu, Y. Wang, P. G. Huggard, P. Hunyor, and H. Wang, "3d printed microwave components for frequencies above 100 ghz," in *2021 IEEE MTT-S International Microwave Filter Workshop (IMFW)*, 2021, pp. 246–248.
- [194] D. Schaubert, E. Kollberg, T. Korzeniowski, T. Thungren, J. Johansson, and K. Yngvesson, "Endfire tapered slot antennas on dielectric substrates," *IEEE Transactions on Antennas and Propagation*, vol. 33, no. 12, pp. 1392–1400, 1985.
- [195] A. Vosoogh, M. S. Sorkherizi, A. U. Zaman, J. Yang, and A. A. Kishk, "Diplexer integration into a ka-band high-gain gap waveguide corporate-fed slot array antenna," in *2017 IEEE International Symposium on Antennas and Propagation USNC/URSI National Radio Science Meeting*, 2017, pp. 2667–2668.
- [196] S. Mukherjee and A. Biswas, "Design of self-diplexing substrate integrated waveguide cavity-backed slot antenna," *IEEE Antennas and Wireless Propagation Letters*, vol. 15, pp. 1775–1778, 2016.
- [197] T. K. Kataria, D. Serrano, J. M. S. Hernandez, D. J. Vazquez, J. L. O. Cervantes, and A. Corona-Chavez, "Novel microwave diplexer for front-end integration," in *2018 International Conference on Electronics, Communications and Computers (CONIELECOMP)*, 2018, pp. 1–4.
- [198] D. Zayniyev, H. F. AbuTarboush, and D. Budimir, "Microstrip antenna diplexers for wireless communications," in *2009 European Microwave Conference (EuMC)*, 2009, pp. 1508–1510.
- [199] Z. Kordiboroujeni, L. Locke, and J. Bornemann, "A diplexing antenna system in substrate integrated waveguide technology," in *2015 IEEE International Symposium on Antennas and*

Propagation USNC/URSI National Radio Science Meeting, 2015, pp. 1042–1043.

- [200] N. H. Baba, A. H. Awang, H. M. Hizan, S. Subahir, and N. H. Abd Rahman., “Design of microwave radiating siw diplexer,” in *2019 International Symposium on Antennas and Propagation (ISAP)*, 2019, pp. 1–3.
- [201] G. Engen, “The six-port reflectometer: An alternative network analyzer,” *IEEE Transactions on Microwave Theory and Techniques*, vol. 25, no. 12, pp. 1075–1080, 1977.

List of Publications

Patents:

1. **Idury Satya Krishna** and Soumava Mukherjee, "Substrate Integrated Coaxial Line Six-Port Network Module For Wide-Bandwidth", Indian Patent Application No. 202211044902. **(Filing Date: 05 August 2022)**

Journals:

1. **Idury Satya Krishna** and Soumava Mukherjee, "Fully Shielded & Self-Packaged Compact Quarter-mode Substrate Integrated Coaxial Line Bandpass Filter for X and K-Band", International Journal of RF and Microwave Computer-Aided Engineering **(Accepted for publication)**
2. **Idury Satya Krishna** and Soumava Mukherjee, "Triple-Mode Substrate Integrated Coaxial Resonator based Bandpass Filter featuring Flexible Transmission Zeros and Controllable Bandwidth", IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 68, no. 4, pp. 1223-1227, April 2021. **(50 most frequently accessed documents in April 2021)**
3. **Idury Satya Krishna** and Soumava Mukherjee, "Dual-mode SICL bandpass filter with via based perturbation technique for K_u -band", IET Electronics Letters, vol. 56, no. 18, pp. 934-937, 2020. **(50 most frequently accessed documents in September 2020)**
4. **Idury Satya Krishna** and Soumava Mukherjee, "SICL-based Wideband Crossover with Low Phase Imbalance & Group Delay", IET Microwaves, Antennas and Propagation, vol. 14, no. 12, pp. 1355-1360, 2020.
5. **Idury Satya Krishna** and Soumava Mukherjee, "Design of Wideband Microstrip to SICL Transition for Millimeter-wave Applications", IEEE Access, vol. 8, pp. 4250-4254, 2019. **(50 most frequently accessed documents in January 2020)**

Conferences:

1. **Idury Satya Krishna**, Naman Baghel, Rajesh Shukla, Sourav Ghosh and Soumava Mukherjee, "Co-Design of a Substrate Integrated Coaxial Line Filter-Antenna for Millimeter-wave Applications," 2021 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (APS/URSI), 2021, pp. 1289-1290.
2. **Idury Satya Krishna** and Soumava Mukherjee, "A Wideband DC Isolated Substrate Integrated Coaxial Line Transition for System Integration," 2020 50th European Microwave Conference (EuMC), Netherlands 2021, pp. 731-734.
3. **Idury Satya Krishna** and Soumava Mukherjee, "Compact Substrate Integrated Coaxial Line Quadrature Hybrid with Harmonic Rejection," 2019 IEEE Asia-Pacific Microwave Conference (APMC), Singapore, 2019, pp. 1149-1151.

4. **Idury Satya Krishna** and Soumava Mukherjee, "Design of a Substrate Integrated Half Mode Coaxial Cavity Filter with Multiple Transmission Zeros," 2019 European Microwave Conference, Paris, 2019, pp. 200-203.
5. **Idury Satya Krishna** and Soumava Mukherjee, "Design of Folded Substrate Integrated Coaxial Line Wideband Balun for K-band Applications," IEEE Conference on Antennas and Propagation (InCAP), Hyderabad, India, 2018, pp. 1-4.
6. **Idury Satya Krishna** and Soumava Mukherjee, "Design of Dual-Mode Substrate Integrated Coaxial Line (SICL) Cavity Filter for Millimeter-wave Applications," International Microwave and RF Conference (IMaRC 2018), Kolkata, India, pp. 1-4.
7. **Idury Satya Krishna** and Soumava Mukherjee, "A Substrate Integrated Coaxial line Dual-Band Balun for 5G Application," 2018 IEEE Asia Pacific Microwave Conference (APMC), Kyoto, 2018, pp. 1190-1192.
8. **Idury Satya Krishna** and Soumava Mukherjee, "Design of Wideband Coaxial-to-Substrate Integrated Coaxial Line (SICL) Planar Transition," 2018 International Conference on Signal Processing and Communications (SPCOM), Bangalore, 2017, pp. 152-156.

Papers under review:

1. **Idury Satya Krishna** and Soumava Mukherjee, "Dual-Broadband Rat-Race Coupler in Substrate Integrated Coaxial Line Technology for X and K-band with Third Order Harmonic Suppression", IEEE Transactions on Circuits and Systems II: Express Briefs (Under Review)

Accolades and Awards:

- Awarded European Microwave Association (EuMA) internship award 2021 to pursue research work at University of Pavia, Italy.
- Received European Microwave Conferences student grant consecutively in EuMC 2020, Utrecht, Netherlands and EuMC 2019, Paris, France.
- Received IEEE MTT-SMGA SSI Sponsorship to present at Asia Pacific Microwave Conference 2019, Singapore.
- Recipient of CSIR Student Travel Grant 2019 (Full Airfare) to attend EuMC 2019, Paris.
- Received student travel grant at IEEE Indian Conference on Antennas and Propagation (InCAP) 2018, Hyderabad, India and Ph.D. student initiative award at IEEE IMaRC (2018).