
REFERENCES

- Adler, R. J., Kiuttu, G. F., Simpkins, B. E., Sullivan, D. J. and Voss, D. E., "Improved electron emission by use of a cloth fibre cathode," *Review of scientific instruments*, vol. 56, no. 5, pp. 766-767, 1985.
- Agee, F. J., Calico, S. E., Hendricks, K. J., Haworth, M. D., Spencer, T. A., Ralph, D. R., Blankenship, E., Clark, M. C. and Lemke, R. W., "Pulse shortening in the magnetically insulated line oscillator (MILO)," *Intense Microwave Pulses IV*, vol. 2843 pp. 144-152, 1996.
- Barker, R. J., and Schamiloglu, E., Eds., *High Power Microwave Sources and Technologies*, IEEE Press/J. Wiley & Sons, New York, 2001.
- Basu, B. N., *Electromagnetic Theory and Applications in Beam-Wave Electronics*, Singapore: World Scientific, 1996.
- Bekefi, G., and Orzechowski, T. J., "Giant microwave bursts emission from field emission, relativistic-electron-beam magnetron," *Phys. Rev. Lett.*, vol. 37, no. 6, pp. 379, 1976.
- Benford, J., "History and Future of the Relativistic Magnetron," *Microwave Sciences*, Lafayette, CA USA, 2010.
- Benford, J., Granatstein, V. L., and Alexeff, I., *Relativistic magnetron*, High Power Microwave Sources, Eds. Boston, MA: Artech House, pp. 351-395, 1987 .
- Benford, J., Swegle, J. A. and Schamiloglu, E., *High Power Microwaves*, 2nd ed. Boca Raton, FL, USA: CRC Press, ch. 3, pp. 43-103, 2007.
- Champeaux, S., Gouard, P., Cousin, R. and Larour, J., "3-D PIC numerical investigations of a novel concept of multistage axial vircator for enhanced microwave generation," *IEEE Transaction on Plasma Science*, vol. 43, no. 11, pp. 3841-3855, 2015.
- Chen, D. B., Wang, D., Meng, F. B. and Fan, Z. K., "Bifrequency magnetically insulated transmission line oscillator," *IEEE transactions on plasma science*, vol. 37, no. 1, pp. 23-29, 2008.
- Chen, D. B., Wang, D., Meng, F. B., Fan, Z. K., Qin, F. and Wen, J., "Bifrequency HPM generation in a MILO with azimuthal partition," *IEEE transactions on plasma science*, vol. 37, no. 10, pp. 1916-1920, 2009.
- Chen, Y. K., "The constant impedance tapered lossless transmission line," M.S. thesis, Dept. Elec. Comp. Eng., Univ. Missouri, Rolla, MO, USA, 1966.

- Clark, M. C., Marder, B. M. and Bacon, L. D., 1988. "Magnetically insulated transmission line oscillator," *Applied physics letters*, vol. 52, no. 1, pp.78-80, 1988.
- Cousin, R., "Compréhension des mécanismes régissant le fonctionnement d'un tube hyperfréquence de type MILO" Ph.D. thesis, Ecole Polytechnique X, France, 2005
- Cousin, R., Larour, J., J. Gardelle, B., Cassany, Modin, P., Gouard, P. and Raymond, P., "Gigawatt emission from a 2.4-GHz compact magnetically insulated line oscillator (MILO)," *IEEE transactions on plasma science*, vol. 35, no. 5, pp. 1467-1474, 2007.
- Davis, J. G. and Gibson, A. A. P., "Higher order mode impedances and cut-off frequencies of overmoded coaxial waveguides," *International journal of electronics*, vol. 93, no. 05, pp. 335-346, 2006.
- Dixit, G. and Jain, P. K., "Equivalent circuit analysis of the disk-loaded coaxial structure for MILO," *IEEE Transactions on Plasma Science*, vol. 44, no. 2, pp. 157-164, 2016.
- Dixit, G. and Singh, B., "Study on Load-Side Optimization in Bifrequency MILO Source," *IEEE Transactions on Plasma Science*, vol. 48, no. 10, pp. 3552-3557, 2020.
- Dixit, G., "Equivalent Circuit Approach to the Beam-Wave Interaction Analysis of Magnetically Insulated Line Oscillator (MILO)" Ph.D. thesis, IIT (BHU), Varanasi, India, 2016.
- Dixit, G., Kumar, A. and Jain, P. K., "Design analysis and simulation study of an efficiency enhanced L-band MILO," *Physics of Plasmas*, vol. 24, no. 1, pp. 013113, 2017.
- Dwivedi, S. and Jain, P. K., "Beam-wave interaction analysis of a magnetically insulated line oscillator," *Physics of Plasmas*, vol. 19, no. 8, pp. 082110, 2012.
- Dwivedi, S. and Jain, P. K., "Design expressions for the magnetically insulated line oscillator," *IEEE Transactions on Plasma Science*, vol. 41, no. 5, pp. 1549-1556, 2013.
- Dwivedi, S. and Jain, P. K., "Electromagnetic analysis of a disk-loaded coaxial waveguiding structure for MILO," *IEEE Transactions on Plasma Science*, vol. 40, no. 4, pp. 1032-1041, 2012.
- Dwivedi, S. and Jain, P. K., "Performance improvement study of tapered magnetically insulated line oscillator through impedance matching," *IEEE Transactions on Plasma Science*, vol. 42, no. 9, pp. 2186-2192, 2014.
- Eastwood, J. W., Hawkins, K. C. and Hook, M. P., "The tapered MILO," *IEEE transactions on plasma science*, vol. 26, no. 3, pp. 698-713, 1998.
- Esteban, J. and Rebollar, J. M., "Characterization of corrugated waveguides by modal analysis," *IEEE transactions on microwave theory and techniques*, vol. 39, no. 6, pp. 937-943, 1991.
- Fan, Y. W., Wang, X. Y., Zhang, Z. C., Xun, T. and Yang, H. W., "A high-efficiency repetitively pulsed magnetically insulated transmission line oscillator," *Vacuum*, vol. 128, pp. 39-44, 2016.

- Fan, Y. W., Yuan, C. W., Zhong, H. H., Shu, T. and Luo, L., "Simulation investigation of an improved MILO," *IEEE transactions on plasma science*, vol. 35, no. 2, pp. 379-383, 2007.
- Fan, Y. W., Yuan, C. W., Zhong, H. H., Shu, T., Zhang, J. D., Yang, J. H., Yang, H. W., Wang, Y. and Luo, L., "Experimental investigation of an improved MILO," *IEEE transactions on plasma science*, vol. 35, no. 4, pp. 1075-1080, 2007.
- Fan, Y. W., Zhong, H. H., Li, Z. Q., Shu, T., Yang, H. W., Zhou, H., Yuan, C. W., Zhou, W. H. and Luo, L., "Repetition rate operation of an improved magnetically insulated transmission line oscillator," *Physics of Plasmas*, vol. 15, no. 8, pp. 083102, 2008.
- Fan, Y. W., Zhong, H. H., Li, Z. Q., Shu, T., Zhang, J. D., Zhang, J., Zhang, X. P., Yang, J. H. and Luo, L., "A double-band high-power microwave source," *Journal of Applied Physics*, vol. 102, no. 10, pp. 103304, 2007.
- Fan, Y. W., Zhong, H. H., Li, Z. Q., Yang, H. W., Shu, T., Zhou, H., Yuan, C. W., Zhang, J. and Luo, L., "A metal-dielectric cathode," *Journal of Applied Physics*, vol. 104, no. 2, pp. 023304, 2008.
- Fan, Y. W., Zhong, H. H., Shu, T. and Li, Z. Q., "Theoretical investigation of the fundamental mode frequency of the magnetically insulated transmission line oscillator," *Physics of Plasmas*, vol. 15, no. 12, pp. 123504, 2008.
- Fan, Y., Wang, X., Li, G., Yang, H., Zhong, H. and Zhang, J., "Experimental demonstration of a tunable load-limited magnetically insulated transmission line oscillator," *IEEE Transactions on Electron Devices*, vol. 63, no. 3, pp. 1307-1311, 2016.
- Friedman, M., Krall, J., Lau, Y. Y. and Serlin, V., "Efficient generation of multigigawatt rf power by a klystronlike amplifier," *Review of scientific instruments*, vol. 61, no. 1, pp.171-181, 1990.
- Gandhi, O. P., *Microwave Engineering and Applications*, New York: Pergamon Press, 1981.
- Gold, S. H. and Nusinovich, G. H., Review of high-power microwave source research," *Beam Physics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, DC* 20375-5346. 1997.
- Gold, S. H., and Nusinovich, G. S., Review of high-power source research, *Zh. Tech. Fiz.*, vol. 52, pp. 106, 1982.
- Granatstein, V. L. and Alexeff, I., "High-Power Microwave Sources," Artech House Boston-London, 1987.
- Haworth, M. D., Baca, G., Benford, J., Englert, T., Hackett, K., Hendricks, K. J., Henley, D., LaCour, M., Lemke, R.W., Price, D. and Ralph, D., "Significant pulse-lengthening in a multigigawatt magnetically insulated transmission line oscillator," *IEEE transaction on plasma science*, vol. 26, no. 3, pp. 312-319, 1998.

- Haworth, M. D., Cartwright, K. L., Luginsland, J. W., Shiffler, D. A. and Umstattd, R. J., "Improved electrostatic design for MILO cathodes," *IEEE transactions on plasma science*, vol. 30, no. 3, pp.992-997, 2002.
- Haworth, M. D., Luginsland, J. W. and Lemke, R. W., "Evidence of a new pulse-shortening mechanism in a load-limited MILO," *IEEE transactions on plasma science*, vol. 28, no. 3, pp. 511-516, 2000.
- He, J., Cao, Y., Zhang, J., Wang, T. and Ling, J., "Design of a dual-frequency high-power microwave generator," *Laser and Particle Beams*, vol. 29, no. 4, pp. 479-485, 2011.
- Jiang, T., He, J., Zhang, J., Li, Z. and Ling, J., "An improved *Ku*-band MILO with tapered choke cavity and enlarged first interaction cavity," *IEEE Transactions on Electron Devices*, vol. 64, no. 1, pp. 286-292, 2016.
- Ju, J. C., Fan, Y. W., Shu, T. and Zhong, H. H., "Proposal of a gigawatt-class L/Ku dual-band magnetically insulated transmission line oscillator," *Physics of Plasmas*, vol. 21, no. 10, pp. 103104, 2014.
- Ju, J. C., Fan, Y. W., Zhong, H. H. and Shu, T., "A novel dual-frequency magnetically insulated transmission line oscillator," *IEEE transactions on plasma science*, vol. 37, no. 10, pp. 2041-2047, 2009.
- Kesari, V., Jain, P. K. and Basu, B. N., "Analysis of a circular waveguide loaded with thick annular metal discs for wide-band gyro-TWTs," *IEEE transactions on plasma science*, vol. 33, no. 4, pp. 1358-1365, 2005.
- Kesari, V., Jain, P. K. and Basu, B. N., "Analytical approaches to a disc-loaded cylindrical waveguide for potential application in wide-band gyro-TWTs," *IEEE transactions on plasma science*, vol. 32, no. 5, pp. 2144-2151, 2004.
- Kim, D. H., Jung, H. C., Min, S. H., Wang, M. C., Rhee, M. J., Park, G. S., Kim, C. H. and Yim, D. W., 2006, "Experimental investigation of giga-watt magnetically insulated transmission line oscillator (MILO) by improved axial power extraction," *IEEE International Vacuum Electronics Conference*, pp. 561-562, 2006.
- Kumar, A., Dwivedi, S. and Jain, P. K., "MILO Performance Improvement Study—An Equivalent Circuit Approach," *IEEE Transactions on Plasma Science*, vol. 47, no. 10, pp. 4642-4649, 2019.
- Kumar, A., Tripathi, P., Dwivedi, S. and Jain, P. K., "Analysis of Azimuthal Partition Periodic Disk-Loaded Coaxial Structure for Bifrequency MILO Using Equivalent Circuit Approach," *IEEE Transactions on Plasma Science*, vol. 48, no. 9, pp. 3030-3039, 2020.
- Lemke, R. W. and Collins Clark, M., "Theory and simulation of high-power microwave generation in a magnetically insulated transmission line oscillator," *Journal of applied physics*, vol. 62, no. 8, pp. 3436-3440, 1987.

- Lemke, R. W., Calico, S. E. and Clark, M. C., "Investigation of a load-limited, magnetically insulated transmission line oscillator (MILO)," *IEEE transactions on plasma science*, vol. 25, no. 2, pp. 364-374, 1997.
- Lemke, R. W., DeMuth, G. E. and Biggs, A. W., "Theoretical and experimental investigation of axial power extraction from a magnetically insulated transmission line oscillator," *In Intense Microwave and Particle Beams*, vol. 1226, pp. 199-208, 1990.
- Lemke, R.W., "Linear stability of relativistic space-charge flow in a magnetically insulated transmission line oscillator," *Journal of applied physics*, vol. 66, no. 3, pp. 1089-1094, 1989.
- Li, A. K. and Fan, Y. W., "Preliminary experimental study of a carbon fibre array cathode," *Journal of Applied Physics*, vol. 120, no. 6, pp. 065105, 2016.
- Li, A. K., Fan, Y. W., Qian, B. L., Li, S. and Yang, H. W., "Improvement of vacuum maintenance capability and output pulse limit in a hard-tube MILO with a carbon fibre array cathode," *Vacuum*, vol. 181, pp. 109723, 2020.
- Mahto, M. and Jain, P. K., "Oscillation condition and efficiency analysis of the reltron," *IEEE Transaction on Plasma Science*, vol. 44, no. 7, pp. 1056-1062, 2016.
- Miller, R. B., "Mechanism of explosive electron emission for dielectric fibre (velvet) cathodes," *Journal of applied physics*, vol. 84, no. 7, pp. 3880-3889, 1998.
- Nallasamy, V., Datta, S. K., Reddy, S. U. and Jain, P. K., "Advances and present trends in magnetically insulated line oscillator," *Journal of electromagnetic waves and applications*, vol. 31, no. 17, pp.1864-1874, 2017.
- Nallasamy, V., Narasimhamurthy, C., Geetha, B., Gupta, S. K., Datta, S. K., Umamaheshwara Reddy, S. and Jain, P. K., "Electromagnetic simulation and experimental characterization of RF interaction structure of an S-band magnetically insulated line oscillator," *Journal of electromagnetic waves and applications*, vol. 31 no. 4, pp. 375-382, 2017.
- Orfanidis, S. J., *Electromagnetic Waves and Antennas*, 2013.
- Qin, F., Wang, D., Xu, S., Zhang, Y. and Fan, Z. K., "Repetitive operation of an L-band magnetically insulated transmission line oscillator with metal array cathode," *Review of Scientific Instruments*, vol. 87, no. 4, pp. 044703, 2016.
- Sagor, R. H. and Amin, M. R., "Linear analysis of an X-band backward wave oscillator with a circular-edge disk-loaded cylindrical waveguide driven by an annular electron beam," *The European Physical Journal Plus*, vol. 132, no. 10, pp. 428, 2017.
- Singh, K., Jain, P. K. and Basu, B. N., "Analysis of a coaxial waveguide corrugated with wedge-shaped radial vanes considering azimuthal harmonic effects," *Progress In Electromagnetics Research*, vol. 47, pp. 297-312, 2004.
- Smith P.D., and Cloude S.R., Eds., *Ultra-Wideband, Short-Pulse Electromagnetics 5*, New York, 2002.

Tang, Y., Meng, L., Li, H., Zheng, L., Wang, B. and Yin, Y., "An X-band dual-frequency coaxial relativistic backward-wave oscillator," *IEEE Transactions on Plasma Science*, vol. 40, no. 12, pp. 3552-3559, 2012.

Wagner, D., Thumm, M. and Kasparek, W., "Hybrid modes in highly oversized corrugated rectangular waveguides," *International journal of infrared and millimeter waves*, vol. 20, no. 4, pp. 567-581, 1999.

Walker, L. R. and Wax, N., "Non-uniform transmission lines and reflection coefficients," *Journal of Applied Physics*, vol. 17, no. 12, pp. 1043-1045, 1946.

Wang, D., Chen, D., Qin, F. and Fan, Z., "Improved bifrequency magnetically insulated transmission line oscillator," *IEEE transactions on plasma science*, vol. 38, no. 1, pp.19-25, 2009.

Wang, D., Fan, J., Chen, D., and Deng, J., "Rigorous analysis of the coaxial disk-loaded waveguide slow-wave structures," *Proc. Int. Conf. Microwave and Millimeter wave Tech.*, Apr. 18-21, 2007.

Wang, D., Fan, Z. K., Chen, D. B. and Deng, J. K., "Investigation of dispersion characteristics in coaxial disk-loaded slow-wave structures with both symmetric and asymmetric modes," *IEEE transaction on plasma science*, vol. 35, no. 4, pp. 1070-1074, 2007.

Wang, D., Fan, Z. K., Chen, D. B. and Deng, J. K., "Simulation of S-band magnetically insulated transmission line oscillator," *High Power Laser and Particle Beams*, vol. 19, no. 11, pp. 24, 2007.

Wang, D., Fan, Z. K., Chen, D. B., and Deng, J. K., "Design and Simulation of Double Ladder Cathode Magnetically Insulated Transmission Oscillator," *High power laser particles and beams*, vol. 19, no. 4, pp. 647-650, 2007.

Wang, H., Yang, Z., Zhao, L. and Liang, Z., "Numerical computation of dispersion curves for symmetric and asymmetric modes in an arbitrary cylindrical metal SWS," *IEEE transactions on plasma science*, vol. 33, no. 1, pp. 111-118, 2005.

Wang, X., Fan, Y., Shu, T., Li, A. and Liu, Z., "Design and Simulation of a Novel High-Efficiency Magnetically Insulated Transmission Line Oscillator," *IEEE Transactions on Plasma Science*, vol. 48, no. 4, pp. 884-887, 2020.

Wang, X., Fan, Y., Shu, T., Li, A., Yu, Y. and Liu, Z., "A High-Efficiency Magnetically Insulated Transmission Line Oscillator with Ridged Disk-Loaded Vanes," *IEEE Transaction on Plasma Science*, vol. 47, no. 8, pp. 3974-3977, 2019.

Watkins, D. A., *Topics in Electromagnetic Theory*, New York: John Wiley, 1958.

Wen, J., Chen, D. B., Wang, D. and Qin, F., "Preliminary experimental research on Ku-band MILO," *IEEE Transactions on Plasma Science*, vol. 41, no. 9, pp. 2501-2505, 2013.

- Xiao, R., Sun, J., Chen, C., Zhang, Y. and Shao, H., "High efficiency annular magnetically insulated line oscillator-transit time oscillator with three separate frequencies in three bands," *Journal of Applied Physics*, vol. 106, no. 3, pp. 033308, 2009.
- Xu, H., Wang, X. Y., Fan, Y. W., Li, A. and Liu, Z., "A High-Efficiency Ridged Magnetically Insulated Transmission Line Oscillator," *IEEE Transactions on Electron Devices*, vol. 67, no. 10, pp. 4442-4446, 2020.
- Xun, T., Fan, Y. W., Yang, H. W., Zhang, Z. C., Chen, D. Q. and Zhang, J. D., "A vacuum-sealed, gigawatt-class, repetitively pulsed high-power microwave source," *Journal of Applied Physics*, vol. 121, no. 23, pp. 234502, 2017.
- Yang, Z., Liang, Z., Zhang, B., Li, J., Ma, W., Hu, S. and Liu, S., "A Cherenkov oscillator operating at two different wave bands," *International journal of infrared and millimeter waves*, vol. 20, no. 1, pp. 83-92, 1999.
- Yu-Wei, F., Hui-Huang, Z., Zhi-Qiang, L., Ting, S., Han-Wu, Y., Jian-Hua, Y., Yong, W., Ling, L. and Yan-Song, Z., "Investigation of an X-band magnetically insulated transmission line oscillator," *Chinese Physics B*, vol. 17, no. 5, pp. 1804, 2008.
- Yu-Wei, F., Ting, S., Yong-Gui, L., Hui-Huang, Z., Zhi-Qiang, L., Yong, W., Yan-Song, Z. and Ling, L., "A compact magnetically insulated line oscillator with new-type beam dump," *Chinese Physics Letters*, vol. 22, no. 1, pp. 164, 2005.
- Zhang, H. and Chen, K. J., "A stub tapped branch-line coupler for dual-band operations," *IEEE Microwave and wireless components letters*, vol. 17, no. 2, pp. 106-108, 2007.
- Zhang, K. Q. and Li, D. J., *Electromagnetic Theory for Microwave and Optical devices*, Berlin, Germany: Springer-Verlag, 1998.
- Zhang, X. P. and Zhong, H. H., "Analysis of the dispersion on MILO coaxial SWS," *High Power Laser and Particle Beams*, vol. 16, no. 3, pp. 363-366, 2004.
- Zhang, X., Dang, F., Zhang, J., Fan, Y. and Li, Z., "Preliminary investigation of an improved metal-dielectric cathode for magnetically insulated transmission line oscillator," *Review of Scientific Instruments*, vol. 86, no. 2, pp. 024705, 2015.
- Zhang, X., Li, Y., Li, Z., Zhong, H. and Qian, B., "Preliminary experimental investigation of a complex dual-band high power microwave source," *Review of Scientific Instruments*, vol. 86, no. 10, pp. 104703, 2015.
- Zhang, Y., Mo, Y. and Zhou, X., "Rigorous analysis of the disk-loaded waveguide slow-wave structures," *International journal of infrared and millimeter waves*, vol. 24, no. 4, pp. 525-535, 2003.
- Zhang, Y., Mo, Y. L., Xu, R. M., Yan, B. and Xie, X. Q., "An investigation of periodic waveguides with axial and azimuthal corrugations," *IEEE transactions on plasma science*, vol. 33, no. 6, pp. 2017-2026, 2005.

Zhang, Y., Mo, Y., Zhou, X. and Li, J., "Study of disk-loaded waveguide filled with plasma," *International Journal of Infrared and Millimeter Waves*, vol. 24, no. 12, pp. 2085-2094, 2003.

Zhi-Qiang, L., Hui-Huang, Z., Yu-Wei, F., Ting, S., Bao-Liang, Q., Liu-Rong, X. and Yan-Song, Z., "Investigation of an S-band tapered magnetically insulated transmission line oscillator," *Chinese Physics Letters*, vol. 26, no. 5, pp. 055201, 2009

AUTHOR'S RELEVANT PUBLICATIONS

Journals:

1. **Nisheeth Upadhyay**, Arjun Kumar, Prabhakar Tripathi and Smrity Dwivedi "Electromagnetic Analysis of an Axially Periodic Disk-Loaded Slow-Wave Structure With Low-Loss Dielectric Filling Between Disks for a Magnetically Insulated Line Oscillator," *IEEE trans. Plasma Sci.*, vol. 50, no. 4, pp. 825-834 ,Apr. 2022.

2. **Nisheeth Upadhyay**, Arjun Kumar, Prabhakar Tripathi and Smrity Dwivedi "Design, Analysis and Simulation Study of Dielectric Filled S-Band Tapered Magnetically Insulated Line Oscillator (MILO)," *INTERNATIONAL JOURNAL OF MICROWAVE AND OPTICAL TECHNOLOGY*, vol. 17, no. 3, pp. 234-242, May 2022.