52. Title: Theoretical and experimental study on transmission properties of THz wave in metal-coated hollow waveguide

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Abstract: Limited by serious material absorption and dispersion in THz wave band, efficient and long distance delivery of THz signal is one of important problems for constructing a compact THz system. Based on the transmission loss coefficient in metal waveguide obtained by perturbation method, the transmission loss properties of THz wave in metal-coated hollow waveguide varying with different metal materials and waveguide structure parameters are simulated. According to the numerical results, an Ag-coated hollow waveguide with inner diameter of 1.1 mm was designed and fabricated, and the transmission loss of THz wave was 8.6 dB/m at frequency of 2.5 THz as found in experiment, which realizes a short distance transmission with ultralow loss in THz region.