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High-Gap Semiconductors and Their Absorption Mechanisms at Millimeter and Submillimeter Wavelengths J.M. DUTTA, C.R. JONES, North Carolina Central University, V. PARSHIN, Applied Physics Institute, RAS, B. GARIN, V. POLYAKOV, A. RUKOVISHNIKOV, Institute of Radio Engineering & Electronics, RAS — Experimental data has been applied to extend the available theoretical models to elucidate the predominate mechanisms of absorption for mm and sub-mm electromagnetic waves in high-gap semiconductors, especially CVD diamond and SiC, which are among the most promising low-loss materials commercially available. Dielectric properties of CVD diamonds, as measured by several laboratories, over a wide range of temperature and frequency will be discussed. The experimental data gathered, both from dielectric and electrical measurements, has been applied to extend available theoretical models for CVD diamonds. Similar studies are undertaken on SiC to determine the primary loss mechanisms for SiC in the mm wavelength range. Preliminary experimental results will be presented.

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