

Passive amplification of the pyroelectric current in thin films on a heat-conducting substrate

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We show both theoretically and experimentally that passive amplification of the pyroelectric current takes place when modulated radiation is recorded by a pyroelectric detector in some range of modulation frequencies. The amplification effect manifests itself in the fact that the current generated by a thin pyroelectric film lying on a massive heat-conducting substrate exceeds that in a freely suspended film. We use a ferroelectric 70:30 P(VDF-TrFE) copolymer, a crystalline guanidine pyroelectric, and a 70:30 composition of an achiral liquid-crystal polymer and its monomer PM6R14n-M6R14n to illustrate the frequency dependence of the pyroelectric current. © Pleiades Publishing, Inc., 2010.