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Preliminary Demonstration of a Method of Radiation Dosimetry using Passive, Integrating LiF:Mg,Ti Thermoluminescent Dosimeters

Radiation dosimetry is traditionally conducted using integrating solid state materials such as optically stimulated luminescent dosimeters (OSLDs) and thermoluminescent dosimeters (TLDs) Fading of signal with time at room temperature has been historically considered an undesirable property of such materials, but can be exploited to extract information about dose as a function of time during the dosimeter deployment period With glow curve analysis, different signal peak areas corresponding to different trapping states may be extracted from TLDs. As these signals fade at unique rates characteristic of each trap type, dose as a function of time may be mathematically determined for as many time periods as different signal peaks are available This work presents the performance of such a method for LiF:Mg,Ti (TLD-100) which involves deconvolution under conditions of hypothetical experimental error The results of an experimental demonstration of the extraction of dose as a function of time for LiF:Mg,Ti dosimeters deployed over an 8-week period will be presented.