

**Abstract:** The role of applied mechanical stress on space charge breakdown in electron beam irradiated polymethyl methacrylate (PMMA) is investigated. Space charge is implanted into PMMA sheets by electron beam. Space charge is measured by laser induced pressure pulse technique to investigate injection, trapping and detrapping of charge. Mechanical stress is applied on PMMA sheet to study its influence on space charge behavior. Experimental results show that applied electric field is not a necessary condition for breakdown of insulating materials. The breakdown can be triggered during space charge detrapping. The detrapping of space charge can result in tree-like breakdown, wherein this phenomenon is termed as space charge breakdown. Effect of applied mechanical stress on the initiation of breakdown and the development of tree-like breakdown is discussed in this paper