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Investigation of laser induced space charge fields in lithium niobate at low temperature with Raman spectroscopy[1] GREG STONE, VOLKMAR DIEROLF, Lehigh University — We report the measurement of space charges fields generated by a laser beam at low temperatures using Raman spectroscopy. Raman spectra obtained with a focused laser exhibits frequency shifts of certain Raman peaks that appear as a function of time. Analysis of these shifts reveals that they originate from changes in the local electric field that are predominately parallel to the z-axis of the crystal. The magnitude of the frequency shifts and the corresponding maximum space charge field established inside the crystal are dependent on the defect concentration. Above a certain threshold field, the built-up space charge field is drastically reduced by discharges and builds up again afterwards. The changes in the Raman spectrum remain after the laser is turned off but disappear upon heating the sample above 200K.

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