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Temperature Dependence of the Dielectric Constant of PMMA for the nEDM Experiment CALLISTA CHRIST, SHIRVEL STANISLAUS, Valparaiso Univ — The nEDM experiment at Oak Ridge National Laboratory is searching for the electric dipole moment of the neutron to an accuracy of order 10^{-28} e-cm. In the experiment, ultra cold neutrons are stored in a cell made from PolyMethylMethAcrylate (PMMA) and will be subjected to a 75 kV/cm electric field at 0.4K. In order to calculate the electric field precisely, the dielectric constant of PMMA must be known as a function of temperature. A measurement made last summer (2016) showed that the dielectric constant does change with temperature as measured down to 150K. This summer, we have improved the cryostat and have measured the temperature dependence of the dielectric constant down to 120K. These results are presented.

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