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Large change in dielectric constant of $CaCu_3Ti_4O_{12}$ under violet laser C. MASINGBOON, Suranaree University of Techology, Nakhon Ratchasima, 30000, Thailand, P. THONGBAI, Khon Kaen University, Khon Kaen, 40000, Thailand, P.D.C. KING, University of St. Andrews, St. Andrews, Fife KY16 9SS, United Kingdom, S. MAENSIRI, W. MEEVASANA, Suranaree University of Techology, Nakhon Ratchasima, 30000, Thailand — This work reports the influence of light illumination on the dielectric constant of $CaCu_3Ti_4O_{12}$ (CCTO) polycrystals which exhibit giant dielectric constant. When the CCTO samples were exposed to 405-nm laser light, the enhancement in capacitance as high as 22% was observed for the first time, suggesting application of light-sensitive capacitance devices. To understand this change better microscopically, we also performed electronic-structure measurements using photoemission spectroscopy, and measured the electrical conductivity of the CCTO samples under different conditions of light exposure and oxygen partial pressure. All these measurements suggest that this large change is driven by oxygen vacancy induced by the irradiation.

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