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Changing the optical and electrical properties of a dielectric surface CRISTIAN BAHRIM, MD KHAIRUZZAMAN, MD MOZAMMAL RAJU, WEI-TAI HSU, Department of Physics, Lamar University — The optical response of a dielectric surface to an incident laser radiation can be shifted when the surface is illuminated with a thermal source of radiation or when a uniform electric field is set up along the surface. Using a blackbody source one can generate an entire curve of dispersion for wavelengths lesser than the wavelength of the probe laser. A low capacitor voltage across the dielectric can shift the wavelength of the probe laser as perceived by the dielectric surface toward smaller values. This shift is due to an increase of the vibrational frequency of the electric dipoles located on the dielectric surface. The change in the polarization properties of the dielectric surface suggests the use of this configuration as an optoelectronic switch driven by a relatively small capacitor voltage. We report results of relative permittivity for flint and crown glasses illuminated with a diode laser of 532 nm. Our measurements indicate that the reflection of the light by the dielectric surface is done within one chemical bond.

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