Infrared studies of topological insulators Bi$_2$Te$_3$, Sb$_2$Te$_3$ and Bi$_2$Se$_3$ S.V. DORDEVIC, M.S. WOLF, The University of Akron, N. STOJILOVIC, University of Wisconsin Oshkosh, HECHANG LEI, C. PETROVIC, Brookhaven National Lab — In this study we have used infrared spectroscopy to probe the electrodynamic response of topological insulators Bi$_2$Te$_3$, Sb$_2$Te$_3$ and Bi$_2$Se$_3$. Infrared spectra are collected over a broad frequency and temperature range. The results reveal similar spectra in all three compounds, with well defined plasma edge located in the far-infrared part of the spectrum. However there are some important differences in the temperature evolution of the spectra. Namely, as temperature decreases the plasma edge shifts to lower frequencies in Bi$_2$Se$_3$, whereas in Bi$_2$Te$_3$ and Sb$_2$Te$_3$ it shifts to higher frequencies.