Far-infrared transmission spectroscopy studies of HoMn$_2$O$_5$ single crystals at the commensurate-incommensurate phase transition$^1$ A.A. SIRENKO, Department of Physics, New Jersey Institute of Technology, Newark, NJ 07102, S. PARK, Department of Physics and Astronomy, Rutgers University, Piscataway, New Jersey 08854, S. M. O’ MALLEY, Department of Physics, New Jersey Institute of Technology, Newark, NJ 07102, G. L. CARR, NSLS, Brookhaven National Laboratory, Upton, New York 11973, S-W. CHEONG, Rutgers Center for Emergent Materials, Department of Physics and Astronomy, Rutgers University, Piscataway, New Jersey 08854 — Spectra of the low-frequency IR-active excitations in HoMn$_2$O$_5$ multiferroic single crystals have been studied using synchrotron radiation based far-infrared transmission spectroscopy at U12IR beamline of NSLS-BNL in the frequency range between 8.5 and 105 cm$^{-1}$. Both preferable polarization of IR-active excitations along crystallographic directions of HoMn$_2$O$_5$ and temperature variation of their oscillator strength reveal strong changes at the commensurate-incommensurate phase transition at $T_c = 19$ K. Transmission spectra are interpreted in terms of the electromagnon, magnon, and crystal-field splitting excitations.

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