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Correlated Variability in the Blazar 3C 454.3[1] ERIN BONNING, CHARLES BAILYN, C. MEGAN URRY, MICHELLE BUXTON, Yale University, GIOVANNI FOSSATI, Rice University, LAURA MARASCHI, INAF - Osservatorio di Brera, PAOLO COPPI, RICHARD SCALZO, JEDIDAH ISLER, ALLISON KAPTUR, Yale University — The blazar 3C 454.3 was revealed by the Fermi Gamma-ray Space Telescope to be in an exceptionally high flux state in July 2008. Accordingly, we performed a multi- wavelength monitoring campaign on this blazar using IR and optical observations from the SMARTS telescopes, optical, UV and X-ray data from the Swift satellite, and public-release gamma-ray data from Fermi. We find an excellent correlation between the IR, optical, UV and gamma-ray light curves, with a time lag of less than one day. The amplitude of the infrared variability is comparable to that in gamma- rays, and larger than at optical or UV wavelengths. The X-ray flux is not strongly correlated with either the gamma-rays or longer wavelength data. These variability characteristics find a natural explanation in the external Compton model, in which electrons with Lorentz factor $\gamma \sim 10^{3-4}$ radiate synchrotron emission in the infrared-optical and also scatter accretion disk or emission line photons to gamma-ray energies, while much cooler electrons ($\gamma \sim 10^{1-2}$) produce X-rays by scattering synchrotron or other ambient photons.

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