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# Simulations of stochastic long-term variability in leptonic models for external-Compton and synchrotron self-Compton dominated blazars

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In this work we investigate the nature of multi-wavelength variability of blazars from a purely numerical approach. We use a time-dependent one-zone leptonic blazar emission model to simulate multi-wavelength variability by introducing stochastic parameter variations in the emission region. These stochastic parameter variations are generated by Monte Carlo methods and have a characteristic power law index, $\alpha = -2$ in their power spectral densities (PSDs). We include representative blazar test cases for a flat spectrum radio quasar (FSRQ) and a high synchrotron peaked BL Lacertae object (HBL) for which the high energy component of the Spectral Energy Distribution (SED) is dominated by external Compton (EC) or synchrotron self-Compton (SSC) emission respectively. The simulated variability is analyzed in order to characterise the distinctions between the two blazar cases and the physical parameters driving the variability. We show that the variability' s power spectrum is closely related to underlying progenitor variations for both cases. Distinct differences between the different progenitor variations are present in the multi-wavelength cross-correlation functions.

## Abstract field

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