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The photospheric origin of E_p-L_p and E_p-E_{iso} correlations in GRBs

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In the current study, we present hydrodynamical simulations and post-process radiation transfer calculations of photospheric emission in GRBs. Our simulations show that the photospheric emission can reproduce the observed correlations among the spectral peak energy, E_p , peak luminosity, L_p , and isotropic energy, E_{iso} , as a consequence of the viewing angle dependence. We also find that the time-resolved property of the emission shows E_p-L_{iso} tracking behavior that is consistent with the observation.

Primary author: ITO, Hirotaka (RIKEN)

Co-authors: Dr MATSUMOTO, Jin; Dr NAGATAKI, Shigehiro; Dr WARREN, Donald; Dr BARKOV, Maxim; Prof. YONETOKU, Daisuke; Dr JUST, Oliver; Mr TAKEI, Yuki

Presenter: ITO, Hirotaka (RIKEN)

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