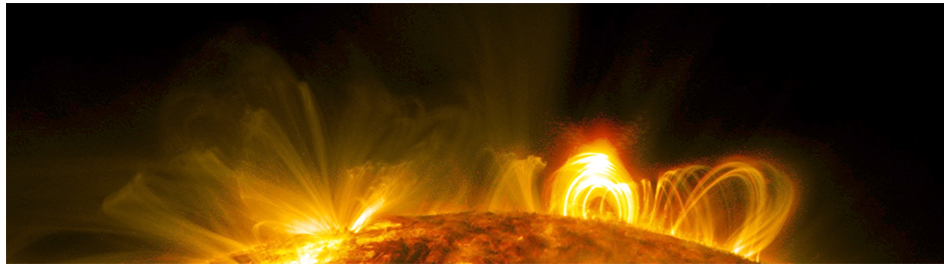


Particle Acceleration in Solar Flares and the Plasma Universe – Deciphering its features under magnetic reconnection



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Efficient electron acceleration in compact binary systems

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The gamma-ray binary systems are a new class of compact binary systems established in the middle of the 2000s, owing to the development of GeV/TeV gamma-ray telescopes. They show non-thermal emission peaking above 1 MeV in their SEDs, which is completely different from X-ray binaries. This feature indicates that efficient electron particle acceleration takes place in these binaries, and its physical mechanism has been a long-standing mystery. In this talk, we review the recent observational result of one of the brightest gamma-ray binaries, LS 5039 with Fermi/LAT and NuSTAR, etc. The obtained spectrum indicates that the dominant component peaking 20-30 MeV is different from the soft X-ray component and it has a very hard spectral index. These features are not yet well explained by the proposed models and challenge our understanding of this object. A possible interpretation is that the MeV gamma-ray emission is synchrotron radiation from electrons accelerated by electric fields directly e.g. relativistic magnetic reconnection. In addition, we will explain a new possibility that this gamma-ray binary may contain a magnetar, which is stimulated by hints of pulsation in hard X-rays using Suzaku/HXD and NuSTAR.

Primary author: YONEDA, Hiroki (RIKEN)

Co-authors: KHANGULYAN, Dmitry; ENOTO, Teruaki; MAKISHIMA, Kazuo; MINE, Kairi; MIZUNO, Tsunefumi; TAKAHASHI, Tadayuki

Presenter: YONEDA, Hiroki (RIKEN)

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