Contribution ID: **77** Type: **not specified**

# A spatially resolved study of hard X-ray emission in Kepler's SNR: indications of different regimes of particle acceleration

*Friday, 14 January 2022 13:45 (10 minutes)*

Synchrotron X-ray emission in young supernova remnants (SNRs) is a powerful diagnostic tool to study the population of high energy electrons accelerated at the shock front and the acceleration process. We performed a spatially resolved spectral analysis of NuSTAR and XMM-Newton observations of the young Kepler's SNR, aiming to study in detail its non-thermal emission in hard X-rays. We selected a set of regions all around the rim of the shell and extracted the corresponding spectra. Then the spectra were analyzed by adopting a model of synchrotron radiation in the loss-limited regime, to constrain the dependence of the cutoff energy of the synchrotron radiation on the shock velocity. We identify two different regimes of particle acceleration, characterized by different Bohm factors. In the north, where the shock interacts with a dense circumstellar medium (CSM), we found a more efficient acceleration than in the south, where the shock velocity is higher and there are no signs of shock-cloud interaction. Our results suggest an enhanced efficiency of the acceleration process in regions where the shock-cloud interaction generates an amplified and turbulent magnetic field. By combining hard X-ray spectra with radio and gamma-ray observations of Kepler's SNR, we propose that the observed gamma-ray emission is mainly hadronic and originates predominantly in the northern part of the remnant.

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**Session Classification:** Young Scientists' Session