A spatially resolved study of hard X-ray emission in Kepler's SNR:

Indications of different regimes of particle acceleration

Sapienza et al. (2022) publ. ApJ

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Kepler's SNR: a laboratory to study the DSA

Shock expanding in different conditions

How synchrotron features change in this conditions?

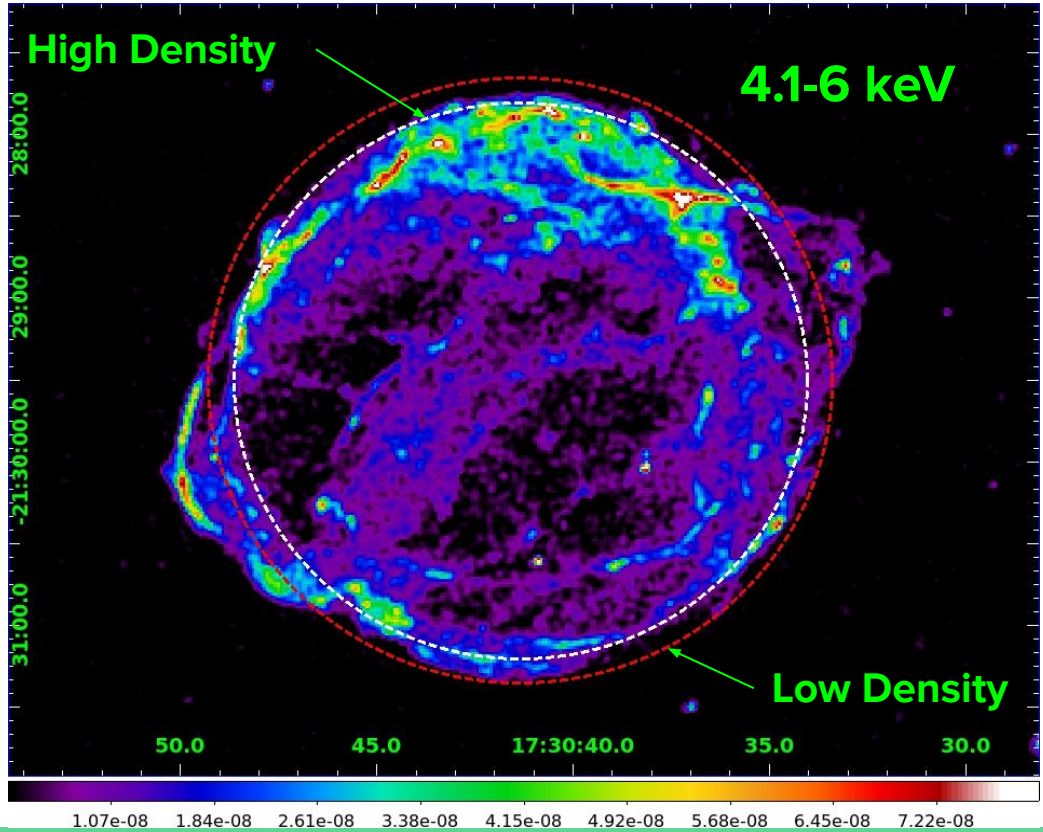
Using XMM-Newton and NuSTAR data

We selected eleven regions on the rim of the shell

Loss limited synchrotron model (Zirakashvili and Aharonian 2007)

$$\varepsilon_0 = \frac{1.6}{\eta}\left(\frac{v_{sh}}{4000\ \mathrm{km\ s^{-1}}}\right)^2 \quad \mathrm{keV}$$

η related to acceleration efficiency



***Chandra** flux image*

Two different regimes of acceleration

Bohm limit: η=1 → Best acceleration efficiency

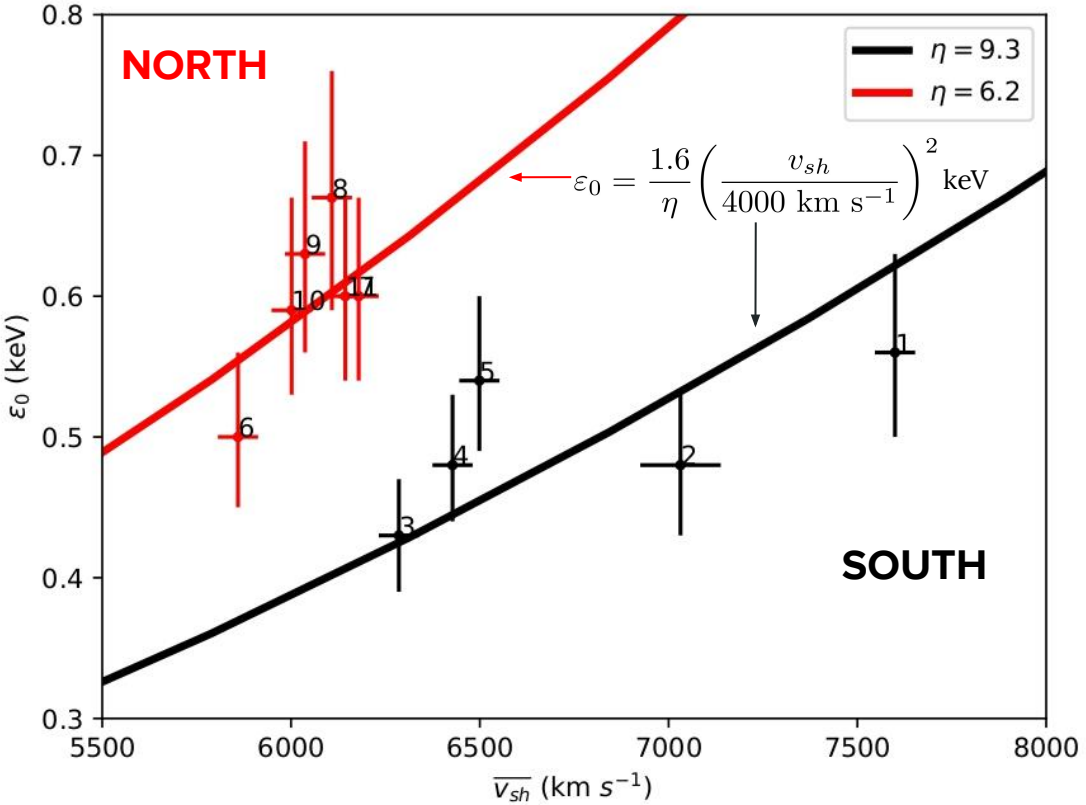
V_{sh}= center-shock position radius / age of Kepler

More efficient acceleration in the north

High turbulence means enhanced magnetic field

AND

A more efficient acceleration



Sapienza et al. (2022):

ε_0 vs. average velocity using Sato & Hughes (2017) center