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Appendix A

A.1

In the figures A.3 and A.4, we show all the measured statistics of the synchrotron intensities (magnetic field disturbances) in the SNR Cassiopeia A, from radii $0.526R$ to $1.093R$ (see figure 3.1 of Chapter 3). We divide the spectra from the whole radial range into two figures, each having four sub-figures in it. We divided it into subfigures to highlight the two facts: A) Behaviour of the statistics of the spectrum near the shock positions in comparison to other regions, B) regions away from the shock positions not showing the power-law like statistics. Figures A.1 and A.2 show the modified version of the figures 3.2 and 3.4. We show it here in these modified forms to visualize the evolution of the spectra as a function of the radius of the SNR.

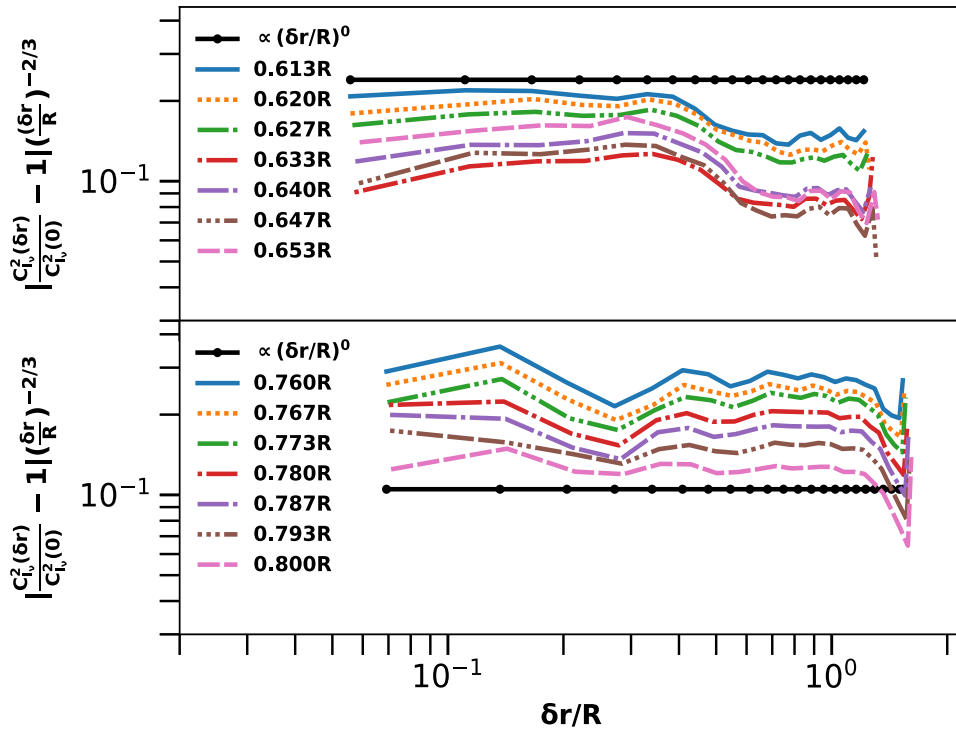


Fig. A.1 : The figure shows the modified version of figure 3.2. We have relatively scaled the amplitudes to clarify the differences in the spectra.

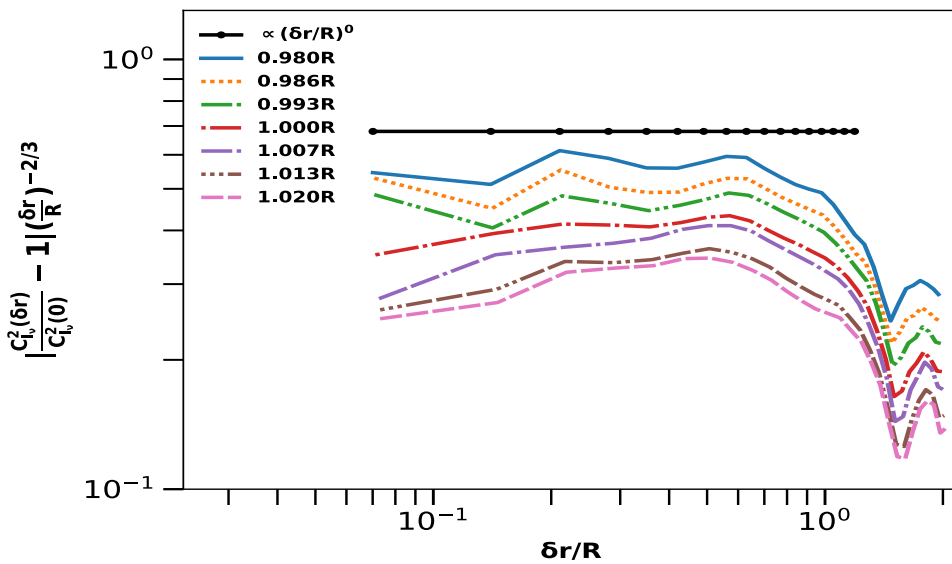


Fig. A.2 : Similar to the figure A.1, this figure also show the modified version of the figure 3.4. Amplitudes are scaled for the purpose of visualization.

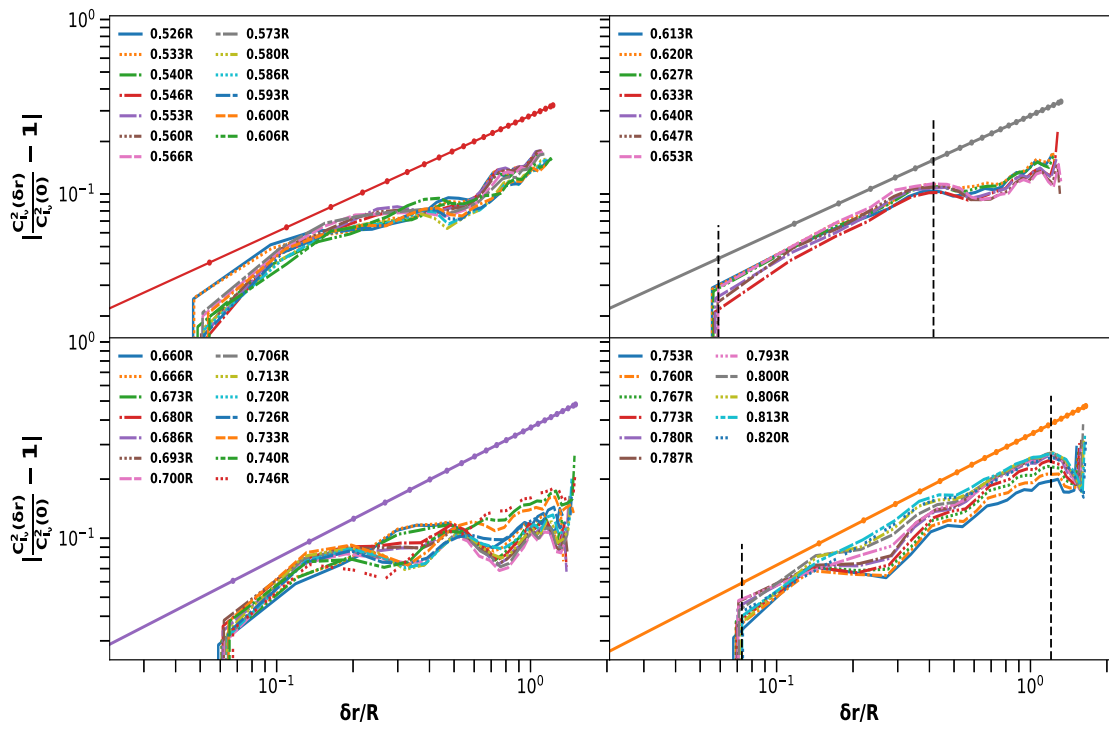


Fig. A.3 : Normalized statistics of the magnetic field disturbances from the radial region of 0.526R to 0.820R.

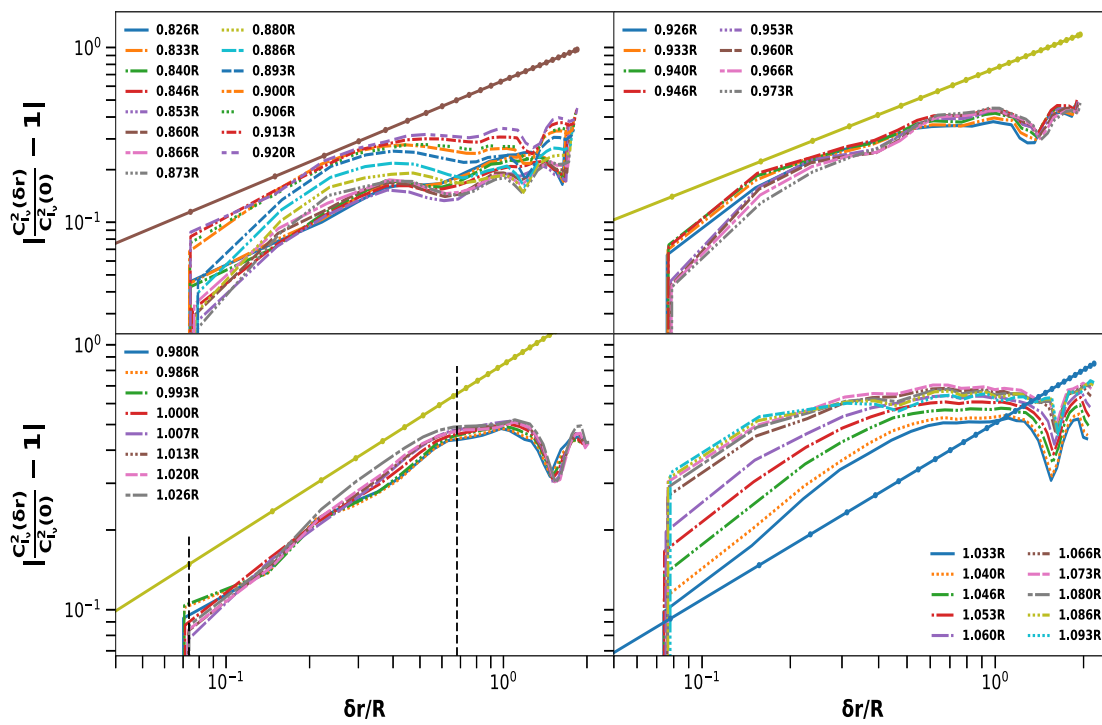


Fig. A.4 : The figure shows the normalized magnetic energy spectra from the radial region of 0.826R to 1.093R

List of publications

In Journals :

1] **Vishwakarma, P. K.** and Dutta, P. (2019).

H I column density statistics of the cold neutral medium from absorption studies.

Monthly Notices of the Royal Astronomical Society, 491(2):2360–2365.

DOI = 10.1093/mnras/stz3148.

2] **Vishwakarma, P. K.** and Kumar, J. (2020).

Trans-Alfvénic magnetohydrodynamic turbulence in the vicinity of supernova remnant Cassiopeia-A shocks.

Monthly Notices of the Royal Astronomical Society, 498(1):1093–1100.

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H I absorption towards the Tycho's supernova remnant.