
Exploring Power Spectra of Faraday Tomography with LOFAR

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Abstract

Faraday tomography has given us a rich and confusing window into the magnetized ISM, revealing complex structures in the Faraday rotation of the Milky Way. Faraday tomography at low frequencies, using LOFAR data, helps by giving us leverage in relating the features we see to distinct ISM features and regions. When I was analyzing such data years ago, I noticed (but didn't investigate) that different polarized features had clearly different characteristic angular scales defining their structure. I'm finally digging into it properly, and finding some fascinating things: different polarization features have dramatically different power spectra. But how to interpret these? I think that, since these features are probably Faraday thin, I can decompose the signals into synchrotron fluctuations and Faraday rotation fluctuations, allowing separate analysis of the two physical processes. I'll present the data and my analysis of it to date, and welcome discussion about how to analyze and interpret both these data and other Faraday tomography results.

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