

High-performance Signal and Data Processing: Challenges in Astro- and Particle Physics and Radio Astronomy Instrumentation



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Noise Sensitivity of a VHF Broadband Interferometers

A VHF interferometer can be used to measure the three-dimensional source of radiation emitted by lightning discharges. This is achieved by analysing the phase delay between the signals recorded at each of the three antennas.

Using a numerical model of an interferometer coded in R we simulated a simple interferometer, including the source, antennas and a data processing unit. First, a monochromatic and isotropic point source was simulated in order to validate the structure of the model. The model was then expanded to include multiple monochromatic signals and finally a truly broadband signal.

Using the model we were able to simulate the effects of noise on the resolving power of the interferometer and determine under what conditions the observations become unreliable.

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