

Fourth MODE Workshop on Differentiable Programming for Experiment Design



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Optimization of the DSA 2000 radio interferometer

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In this presentation, I will discuss the forward modeling of the DSA 2000 radio interferometer, an array set to exceed the capabilities of any existing or planned radio interferometer. Our approach leverages forward modeling to design and validate the system, ensuring it meets scientific requirements, budget constraints, and computational feasibility. I will introduce our JAX-based forward modeling framework, highlighting its distributive, auto-differentiation, and high-level programming capabilities, which facilitate rapid prototyping and development. This talk will also showcase several novel results from our forward modeling efforts. This marks the first instance where forward modeling has been applied with such detail to characterize a radio interferometer both before and after construction.

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