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**Development of a Pattern Simulator for Benchmarking a Near-field Holographic Image Processor**[1] KATE MARTIN, North Georgia College & State University, CHRISTOPHER BEAUDOIN, MIT Haystack Observatory — Deformations of the reflector optics comprising a radio telescope can introduce station position errors that are significant in the context of VLBI2010. Radio holographic imaging is a technique that can be utilized to detect such deformations. In experiments involving large reflector antennas at relatively high frequencies, geosynchronous satellites are observed to conduct far-field radio holography since the stand-off ranges satisfy the far-field requirement. However, these sources are relatively fixed with respect to the radio telescope and this limitation does not facilitate the ability to characterize the deformations over the telescope's full field-of-view. The near-field holographic imaging technique overcomes this limitation of the satellite-based far-field technique since the source is under the control of the observer and may be placed in close proximity to the radio telescope in question. Additional complexities arise in this near-field scenario but these considerations have been addressed in the literature. In this report, a near-field antenna pattern simulator was developed to facilitate testing of a near-field holographic image processor. The results of this simulator have been compared against independent expectations to validate the simulator.

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