

DESIGN AND FABRICATION OF THE D3A6 ANTENNA: A THREE ELEMENT PROTOTYPE ARRAY FOR THE CHORD PROJECT

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The Canadian Hydrogen Observatory and Radio-transient Detector (CHORD) project requires the construction of 512 x 6m radio reflectors to be arranged in a tightly spaced regular grid. The telescope will be built on-site at the Dominion Radio Astrophysical Observatory (DRAO). The reflectors must have a surface accuracy which far exceeds that normally required for a telescope of the intended frequency range (300MHz to 1.5GHz), with an even tighter restriction on uniformity between reflectors. In addition, the project budget of \$23m is relatively modest so the reflector costs must be kept to a minimum.

A prototype array of three test dishes is under construction to test concepts and to refine the final design for CHORD. This array has been named the Deep Dish Development Array 6m (D3A6).

With the given constraints on the cost and dish-to-dish uniformity, the authors posit that the only viable choice for radio reflector fabrication for this telescope is vacuum infused e-glass in polyester resin. No other combination of composite material and fabrication technique is as cost effective, while also insuring the degree of uniformity required between reflectors.

This paper will describe the D3A6/CHORD composite reflector, the structural design, the material choices, modeling of the dish and the metrology efforts.

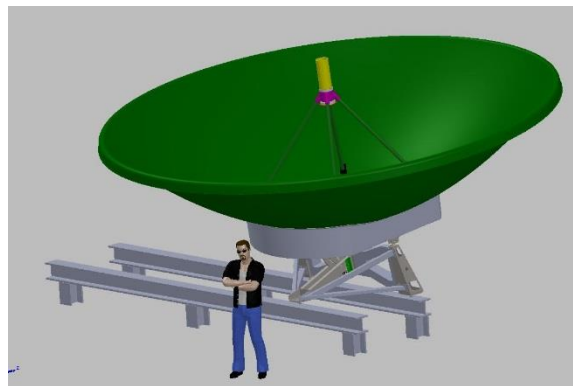


Figure 1: The D3A6 reflector mounted on its base and rail foundation.