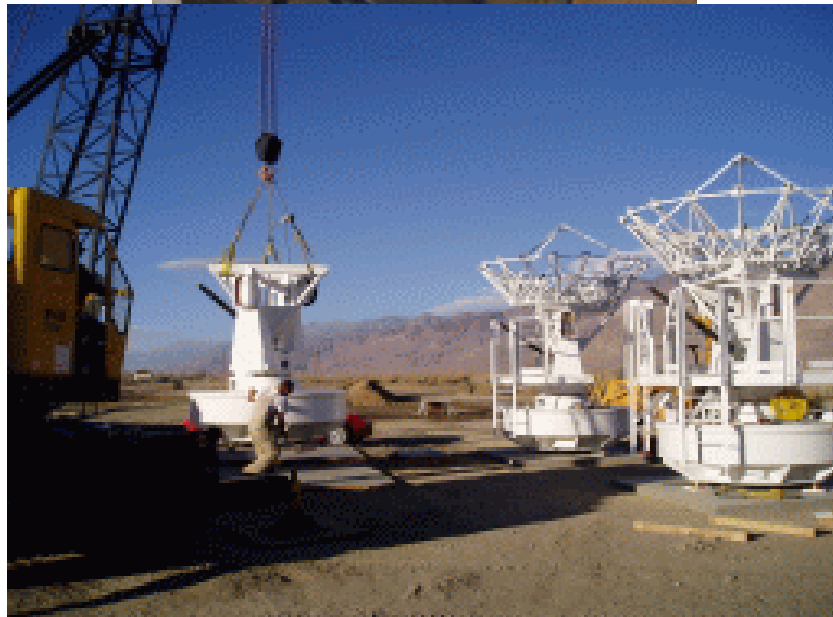
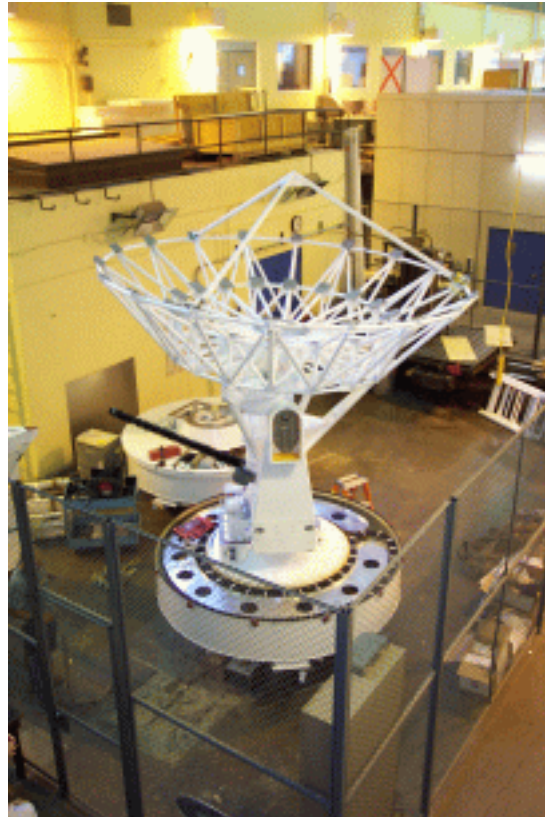


The SZA



Polarizers in Interferometers:

- Use Point Sources to Calibrate Instrument
 - Sources are often polarized
 - Leads to Modulation of signal

Circular to Linear Polarizer can fix this problem for the SZA (90 GHz)

If polarizer can be made broadband, it can be used for the same purpose in other instruments, and it can allow CMB polarization measurements with the SZA dishes.

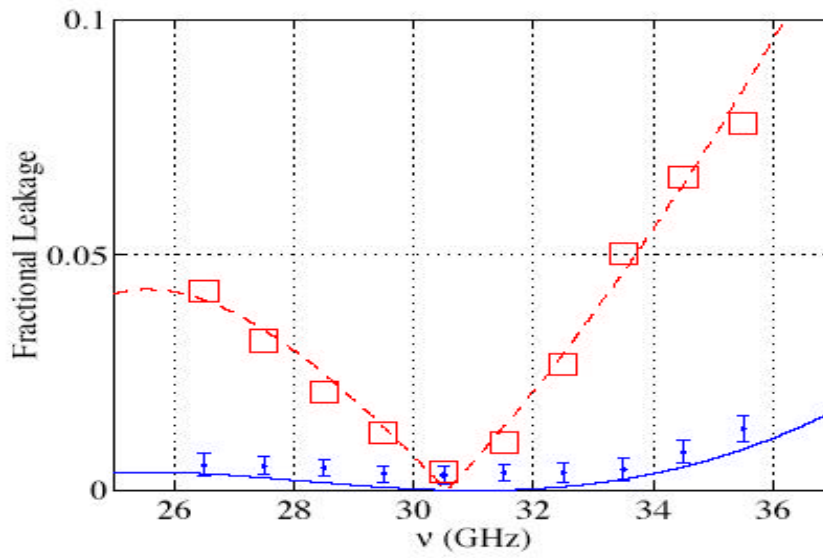
My goal: Design, build and test a broadband circular polarizer at 90 GHz

Making a polarizer:

Dielectric

Consider a waveguide section that contains dielectric slabs in one dimension. A phase difference will be introduced between the X and Y modes of the propagating wave. It can be designed so that the phase difference is 90 degrees (creating circular polarization). Many other methods of introducing a polarization are possible.

Combination of multiple elements can produce broadband behavior:



Polarization performance of one element (red) and two element (blue) polarizers.

How to Proceed:

- Produce a design for broadband polarizer
 - similar design exists for 30 GHz
 - simulation software is available
 - standard set of tricks
 - can find a design that works that is simple enough to manufacture

- Pay someone to build it
- Test its polarization properties
- Install it in SZA telescopes

