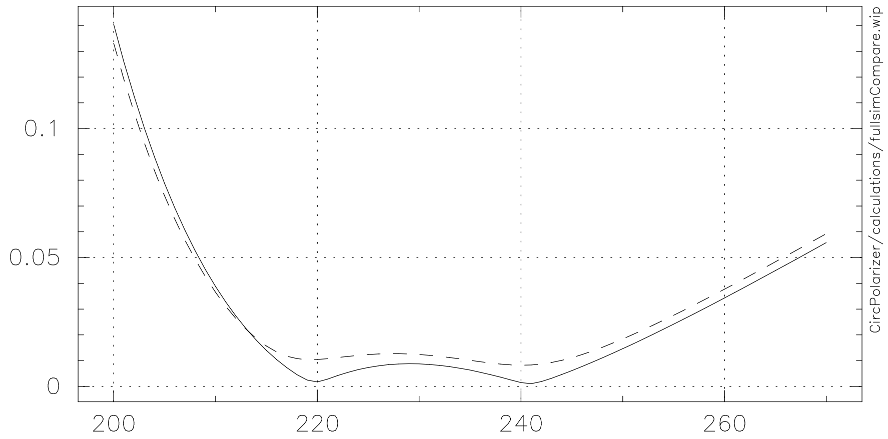

Fig. 16.— (*solid curve*) Polarization leakage through the polarizer in Fig. 13 computed from the HFSS simulation results in Fig. 15. (*dashed*) Leakage computed using the analytic model in `pol.py` for these same dimensions; the analytic model does not include phase shifts due to reactance at the transitions, hence the retarders are not exactly the correct lengths.

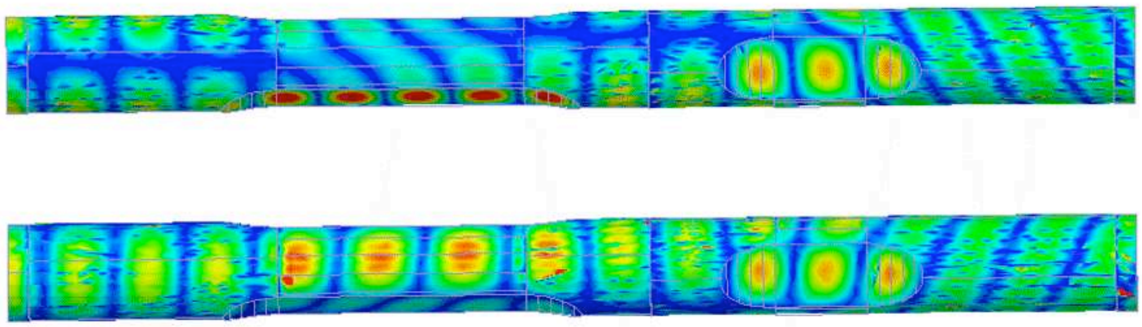

Fig. 17.— HFSS simulation showing E-field amplitudes in the polarizer. A Y-polarized signal incident from the left is converted to L (*top*), while an X-polarized signal is converted to R (*bottom*).

polarization system should require approximately 30 times more LO power because there are two mixers, each with a series array of 4 SIS junctions. The LO polarization will be flipped by 90 degrees on the 10-m telescopes when the new system is installed, and it will probably be necessary to use $0.001''$ or even $0.0015''$ thick beamsplitters.

We now evaluate the polarization leakage including the effects of the beamsplitters. From Born & Wolf (1959; sections 1.5.2 and 7.6.1) the amplitude of a signal transmitted through the beamsplitter is given by

$$A^{(t)} = \frac{tt'}{1 - r'^2 e^{i\delta}} A^{(i)} \tag{8}$$