

DEPOLARIZATION OF RADIATION BY NON-ABSORBING FOAMS

Basil T. Wong and M. Pinar Mengüç
Department of Mechanical Engineering,
University of Kentucky,
Lexington, Kentucky 40506-0108.

ABSTRACT. A Monte Carlo/Ray Tracing technique is developed to investigate the depolarization of radiation by foams simulated as layers of air-bubble laden substrates. Angular and radial profiles of reflection and transmittance are predicted for one-dimensional media subjected to a collimated, polarized light beam. The effects of different bubble sizes, separation distance distributions between bubbles, and medium thickness are considered. Fresnel reflections at the boundaries of bubbles are accounted for using a ray-tracing approach. Calculations are performed to determine vertical and horizontal polarization components of both radial and angular profiles of reflection and transmission. It is shown that if the polarized reflection and transmission data can be obtained from carefully conducted experiments, they can be effectively used to diagnose the changes in the structure of foams.