# Radiation Transfer in 3D Numerical Simulations

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We simulate convection near the solar surface, where the continuum optical depth is of order unity. Hence, to determine the radiative heating and cooling in the energy conservation equation, we must solve the radiative transfer equation (instead of using the diffusion or optically thin cooling approximations). A method efficient enough to calculate the radiation for thousands of time steps is needed. We explicitly solve the Feautrier equation along a vertical and four straight, slanted, rays (at four azimuthal angles which are rotated every time step) assuming LTE and using a 4 bin opacity distribution function. We will discuss details of our approach. We also present some results showing comparison of simulated and observed line profiles in the Sun, the importance of 3D transfer, stokes profiles for intergranule magnetic fields and micropores, and the effect of radiation on p-mode asymmetries.