

**Meeting:** 1003, Atlanta, Georgia, SS 28A, AMS-SIAM Special Session on Reaction Diffusion Equations and Applications, I

1003-35-853            **Steven Rosencrans** and **Xuefeng Wang\*** ([xdw@math.tulane.edu](mailto:xdw@math.tulane.edu)). *Estimating the effectiveness of anisotropic insulators*. Preliminary report.

A heat-conducting material is anisotropic if the rate of diffusion of heat is direction-dependent. (This is often the case with nano-materials after homogenization.)

The conductivity properties of the medium are determined by a constant positive-definite matrix which, in the isotropic case, is a scalar times the identity. The time required for a hot boundary to significantly change the interior temperature of a body is roughly inversely proportional to the principal Dirichlet eigenvalue of minus the linear second-order elliptic operator (associated with this matrix) on this body. This eigenvalue is estimated in several practical situations. (Received September 30, 2004)