

## **Modelling of Marangoni convection using proper orthogonal decomposition**

### **ABSTRACT**

Proper orthogonal decomposition (POD) is applied to Marangoni convection in a horizontal fluid layer heated from below and cooled from above with non-deformable free surface. We investigate two-dimensional Marangoni convection for the case of free-slip bottom in the limit of small Prandtl number. The POD technique is then used to the velocity and temperature data to obtain basis functions for both velocity and temperature fields. When these basis functions are used in a Galerkin procedure, the low-dimensional of Marangoni convection are constructed with the smallest possible degree of freedom. The results based on this low-dimensional model are discussed.

**Keyword:** Marangoni convection, Proper orthogonal decomposition, Low-dimensional model