Modelling the infrared water emission from circumstellar envelopes and molecular clouds

E. Gonzalez-Alfonso[1,2]

[1] CSIC, IEM, Dpto Fisica Molecular, Serrano 123, E-28006 Madrid, Spain
[2] Universidad de Alcala de Henares, Departamento de Fisica, Campus Universitario, E-28871 Alcala de Henares, Madrid, Spain

Abstract

Thermal emission by water vapour from envelopes of late-type stars and molecular clouds has been extensively detected by ISO. However, an adequate interpretation of these data requires the understanding of the excitation mechanism of H2O in the various physical enviroments of interest. We present detailed models of the water excitation and emission, with special emphasis in the role that plays the dust emission and the first bending vibrational state of H2O. We also discuss the limitations and accuracy of the codes which are based on the probability escape approach in interpreting the above data, and discuss the most suitable value of the water abundance that emerge from the present data.