Workshop

Imaging of Stellar Surfaces

ESO Garching, March 5-9, 2018

Kateryna Kravchenko
Institute of Astronomy and Astrophysics, Universite Libre de Bruxelles, Brussels, Belgium

Title:
Tomography of the red supergiant star mu Cep

Abstract:
We present a tomographic method allowing to recover the velocity field at different optical depths in a stellar atmosphere. It is based on the computation of the contribution function to identify the depth of formation of spectral lines in order to construct numerical masks probing different optical depths. These masks are cross-correlated with observed spectra to extract information about the average shape of lines forming at a given optical depth and to derive the velocity field projected on the line of sight. We applied this method to series of spectra of the red supergiant star mu Cep and derived velocities in different atmospheric layers. The resulting velocity variations reveal complex atmospheric dynamics and indicate that convective cells are present in the atmosphere of the mu Cep. The mu Cep velocities were compared with those obtained by applying the tomographic masks to series of snapshot spectra from 3D radiative-hydrodynamics CO5BOLD simulations.