CHEMODYNAMIC AND PHOTOMETRIC EVOLUTION OF ELLIPTICAL GALAXIES

J. LOXEN, U. FRITZE - V. ALVENSLEBEN AND K.J. FRICKE
Universitäts-Sternwarte Göttingen
Geismarlandstraße 11, 37083 Göttingen

AND

G. HENSLER
Universitätssternwarte Kiel
Olshausenstraße 40, 24118 Kiel

In many hydrodynamical models of elliptical galaxies the absence of information about the detailed evolution of stars and the spectro-photometric output by hot gas and stars leads to a missing link between the data we obtain in observations (photons) and the internal behavior (dynamics) of a galaxy.
As an approach to a better understanding of this we developed a coupling of two model descriptions for elliptical galaxies. The first is a chemodynamic code which handles the interaction of several star and gas components in an eulerian one-dimensional grid including complete hydrodynamics via equations of state, momentum and energy. Few results about observable features are given by this model. The second description is a one-zone model of galaxies with raw assumptions about internal dynamics but with a detailed scheme for the evolution of stars in a Monte-Carlo method. Luminosities, colours and spectra can be calculated with this code.
The coupling of these two descriptions establishes the missing link: The impact of stellar evolution (e.g. heating by supernovae ...) on the internal dynamics and, vice versa, the influence of hydrodynamics back on observable data (due to star-formation or cooling processes etc.) can now be studied in detail and compared directly with observations.
This work was supported in part by DFG-grant Fr 325/33-1.