ON THE EVOLUTION OF THE MASS DENSITY PROFILE OF PRESTELLAR AND PROTOSTELLAR CORES

SAVA DONKOV[1], IVAN ZH. STEFANOV[2], TODOR V. VELTCHEV[3,4]

[1]*Institute of Astronomy and National Astronomical Observatory, Bulgarian Academy of Sciences, 72 Tsarigradsko Shosse, 1784 Sofia, Bulgaria*
[2]*Department of Applied Physics, Faculty of Applied Mathematics, Technical University-Sofia, 8 Kliment Ohridski Blvd., Sofia 1000, Bulgaria*
[3]*Faculty of Physics, University of Sofia, 5 James Bourchier Blvd., 1164 Sofia, Bulgaria*
[4]*Universitat Heidelberg, Zentrum fur Astronomie, Institut fur Theoretische Astrophysik, Albert-Ueberle-Str. 2, 69120 Heidelberg, Germany*
E-mail: sddonkov@astro.bas.bg

Starting from the equations of the medium (the Euler system and the Equation of State) we aim to derive equations, which describe the evolution of the exponent of the mass density profile of pre/proto-stellar cores. We suppose that this exponent depends on both the time and the scale. Our considerations are done under the assumptions of spherical symmetry, isotropy and isothermal Equation of State, which determine our core as the abstract ensemble averaged member of a whole class of equivalent objects (cores), demonstrating the same statistical and physical characteristics. We study, also, the special case, when the exponent depends only on time. In this case the value "2" of the exponent is an attractor.