

Short talk

DENSITY DISTRIBUTION FUNCTION IN A SELF-GRAVITATING INCOMPRESSIBLE TURBULENT FLUID

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We have set ourselves the task of obtaining the probability distribution function of the mass density of a self-gravitating incompressible turbulent fluid. We have applied a new approach that takes into account the fractal nature of the fluid. Using the medium equations we show that the total energy per unit mass is an invariant with respect to the fractal scales. As a next step we obtain a nonlinear differential equation for the probability distribution function of the mass density. It is solved numerically in several particular cases. For all considered values of the parameters the solutions look alike. They are power-law distributions with slope ranging between -1.5 and -2.

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SOFTWARE TOOL FOR TIME CONVERSION IN THE WFPDB

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An important part of the digitization of astronomical photographic plates is the determination of the plate exposure beginning. The time of the observation, which can be found written in the astronomical logbooks or on the plate envelopes and even on the plates, is often in local time, or sidereal time, or in Julian dates. Timetool presented here is open source software (github.com/nkirov/timetool), which transforms any time format to Universal time. The tool reads the input data in the Wide-Field Plate Database (WFPDB - www.wfpdb.org) format and outputs the data in the same format, following some strong conventions about the file names.