CONDENSATIONS AND CAVITIES

F.Occhionero,P.Santangelo, and N.Vittorio

Istituto di Astrofisica Spaziale,C.N.R., Frascati
and
Istituto Astronomico, Università di Roma, ITALY

We present a unified algorithm which describes the non-linear growth 1) of condensations surrounded by cavities or 2) of cavities surrounded by condensations (i.e. ridges of higher density) in the Hubble flow. The main idealization is that of pressureless spherical symmetry (Tolman-Bondi solution); overall algebraic details and results for problem 1) are given in previous work (Occhionero,et al.,1981 a and b); results for problem 2) will be given elsewhere (Occhionero,et al.,1982).

Each perturbation is embedded in a Friedmann model; for the simplest Einstein-de Sitter case results are expressed in analytic form; the generalization to any other cosmological model is straightforward. Our models have two parameters which relate to the amplitude and the shape of the initial perturbation. The first of these defines either 1) the height of the density excess in the condensation or 2) the depth of the hole; the second defines the shape either 1) of the surrounding cavity or 2) of the surrounding mass ridge.

Recent tridimensional studies of the distribution of cosmic matter suggest the existence of large scale voids surrounded by superclusters of galaxies. In the scenario of problem 2), we may infer that galaxies form where the expanding ridges originating from nearby holes collide (and possibly coalesce in presence of dissipative phenomena).

REFERENCES

Occhionero,F.,Veccia-Scavalli,L.,and Vittorio,N.,1981 a,Astr.Ap.,97,169
----------,1981 b,Astr.Ap.,99,L12
Occhionero,F.,Santangelo,P.,and Vittorio,N.,1982,Astr.Ap., in press

G. O. Abell and G. Chincarini (eds.), Early Evolution of the Universe and Its Present Structure, 217.