ABOUT THE COMA CLUSTER (Progress Report)

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The study of the dynamics of the Coma Cluster is of interest for several reasons. First, there exists a great deal of observational information about the cluster, including data on morphology, magnitude, color and redshift for the galaxies, and reasonably detailed x-ray data for the hot gas. Second, the present dynamical state of the cluster is reasonably well-defined. In addition, the segregation of the more luminous (≡ massive) galaxies towards the cluster center shows that two-body relaxation effects are well-advanced (Capelato et al. 1980). The profile of velocity dispersion with radius shows that in the outer parts of the cluster the galaxy velocities are non-isothermal (des Forêts et al. 1984). There is, however, evidence of continuing dynamical evolution. The velocity field of the galaxies at large distances from the center of the cluster suggests continuing infall (Capelato et al. 1982), and two sub-condensations are located in the inner regions (Mazure and Proust 1986). A new dynamical analysis for the cluster is being carried out in two stages. First, a relaxed model with a wide mass spectrum (c.f. Inagaki 1980) is fitted to the data. The contribution of the intergalactic gas is taken into account. With H_o = 75 km/sec/Mpc, the total mass within a 3° radius of the center is $\sim 1.5 \times 10^{15}\ M_\odot$, of which ~ 30% is in the intergalactic medium, and $M/L \sim 75\ M_\odot/L_\odot$. The ratio of specific energies of the galaxies and the gas is ~ 1.1, i.e., there is no scale-height problem (these results are described more fully by Gerbal et al. 1986). A second "model independent" analysis using the profiles of the galactic density and velocity dispersion gives the radial dependence of the galactic mass, the gas mass and also gives the total mass, which is found to be $\sim 1.1 \times 10^{15}\ M_\odot$ within 3° (Gerbal et al. 1984).

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