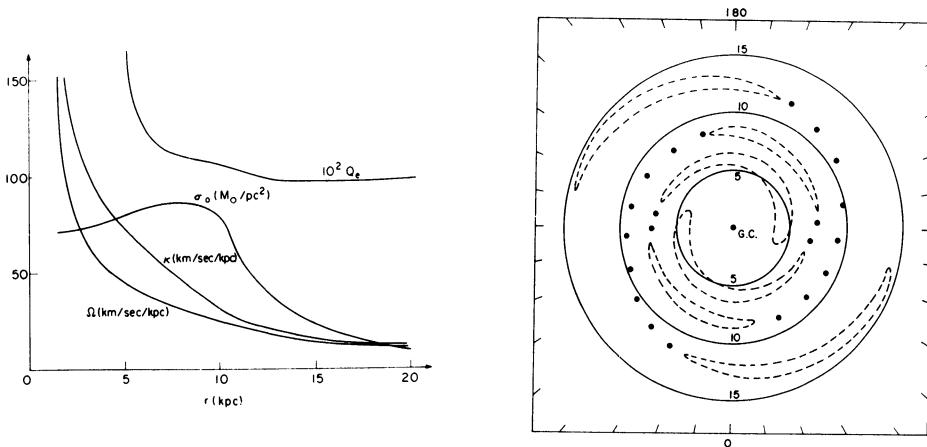


UNSTABLE SPIRAL MODES IN THE MILKY WAY SYSTEM

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Discrete spiral modes of density waves have been calculated for models of the Milky Way system. The calculation is based on a fluid dynamical formulation. (See Lau and Bertin, 1978.) The equilibrium assumes a rotation curve given by Schmidt in 1965. The surface density σ of the active disk is less than the projected value implied by the Schmidt model, because of the presence of the spheroidal component and of the finite thickness of the disk. One such model (left figure) supports a spiral mode with a pattern speed of 13.6 km/sec/kpc. The spiral pattern (right figure) is very similar to that calculated earlier by Lin and Shu (1967) who used only the short wave. The perturbation density on the contours shown equals 1/5 of the maxima. There are other unstable modes. The modes are sensitive to the assumed Q profile. The superposition of these modes opens the way to the explanation of the complicated features observed but not well explained by the single spiral pattern computed earlier.



Lau, Y.Y. and Bertin, G.: 1978, *Astrophys. J.*, in press.
 Lin, C.C. and Shu, F.H.: 1967, *Proc. I.A.U. Symp. No. 31*,
 (Noordwijk), p. 313.