

APPLICABILITY OF JEANS CRITERION

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Abstract. Applicability of gravitational instability criterion is discussed for some typical configurations. It is shown that the small perturbation method has to be applied locally only, the reason being that the medium of a self-gravitating cloud cannot be considered homogeneous throughout the whole space. Consequently, there is an upper limit to the geometrical size of a perturbation, defined by the typical inhomogeneity scale length \mathcal{L} . On the other hand, according to Jeans criterion, the gravitational instability sets in for perturbations having their linear dimensions larger than some critical length L_J , the Jeans length. It is therefore of importance to estimate the value of the ratio \mathcal{L}/L_J in order to be sure that the local analysis conclusions are meaningful.