

# Generalized Kolmogorov System

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The existence of Lyapunov function is proved for some general dynamical system in Kolmogorov framework

$$x' = g(x)G(x, y), y' = h(y)H(x, y)$$

with nonzero stationary solution under some monotonicity assumptions imposed on nonlinearities. The applications include different variations of astrophysical and predator-prey models. Moreover, the existence of heteroclinic orbit is established together with estimates for its range. The applications include both stationary radially symmetric solutions for Smoluchowski-Poisson and Tolman-Oppenheimer-Volkoff equation in Milne integrated density variables. Finally, numerics will be provided for some models for Sagittarius A\* discussed recently by Crespi et al.

## References

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