

# Global existence and asymptotic behavior of solutions to the hyperbolic Keller-Segel equation with a logistic source

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## ABSTRACT

In this paper we consider a hyperbolic Keller-Segel system with a logistic source in two dimension;

$$\begin{aligned}\partial_t n &= \nabla \cdot (nq) + n(1 - n) \\ \partial_t q &= \nabla n\end{aligned}$$

We show the system has a global smooth solution upon small perturbation around a constant equilibrium  $(n, q) = (1, 0)$  and the solution satisfies a dissipative energy inequality. To do this we find a convex entropy functional and a compensating matrix, which transforms the partially dissipative system into a uniformly dissipative one. Those two ingredients were crucial for the study of a partially dissipative hyperbolic system [1–3].

## REFERENCES

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