

# On the stability of a self-propelled swarm system with linear coupling

In the talk, we discuss dynamical properties of a swarm of self-propelled particles with linear coupling governed by the system  $\ddot{r}_k = -p_k(|\dot{r}_k|)\dot{r}_k - \sum_m a_{k,m}r_m$ ,  $r_k \in R^d$ , where the matrix  $A = \{a_{n,m}\}$  is symmetric and positive-semidefinite and the self-propulsion functions  $p_k$  satisfy  $p_z(z)z \rightarrow \infty$  as  $z \rightarrow \infty$ . We discuss stability of ring configurations and the dissipativity properties of the system. This is joint work with Irina Popovici and Carl Kolon and is based on our recent articles arXiv:2110.06344 and arXiv:2105.11419.