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Susmita Sadhu* (susmita.sadhu@gcsu.edu) and **Saikat Chakraborty Thakur** (saikat@ucsd.edu). *Mixed mode oscillations in a singularly perturbed predator-prey-scavenger model with Holling Type II functional response.*

We consider a three-dimensional singularly perturbed predator-prey system with two predators competing directly for the same prey in a constant environment. The second predator is also a scavenger. We take into account the interference competition between the predator and the predating scavenger, and consider a Holling Type II functional response. In addition to relaxation oscillations (ROs), we observe complex dynamics such as mixed mode oscillations (MMOs), which are combinations of short amplitude oscillations (SAOs) and ROs in the system. Using the standard singular perturbation theory, the existence of stable ROs can be explained. On the other hand, MMOs in the system arise due to canard dynamics. We observe canards due to the presence of folded node singularity and also due to singular Hopf bifurcation. ROs reflect the coexistence of the three species with diversified time response. During such cycles, the population density of the prey goes through a very rapid fluctuation (with a sudden crash or an outbreak) over a fast time scale followed by a slow recovery in between. The SAOs associated with the MMOs delay the time intervals between two consecutive outbreaks/crashes in the prey population. (Received September 15, 2014)