

INDAM MEETING:  
**HYPERBOLIC DYNAMICAL SYSTEMS  
IN THE SCIENCES**

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**On the dynamics of the Yoccoz-Birkeland model for the *Microtus Epiroticus***

We study the discretized version of the dynamical system given by

$$N(t) = \int_{A_0}^{A_1} N(t-a) m(N(t-a)) m_\rho(t-a) S(a) da$$

where the initial condition  $N(t), t \in [-A_1, 0]$ , is a continuous function and  $m(N), m_\rho(t), S(a)$  are parameter functions that determine the evolution law. The system has been proposed by Yoccoz and Birkeland to describe the evolution of the population of *Microtus Epiroticus* (sibling vole) on Svalbard Isles. We prove that, for certain values of the parameters, the system is topologically mixing, which explains some of the high oscillations observed in Nature.