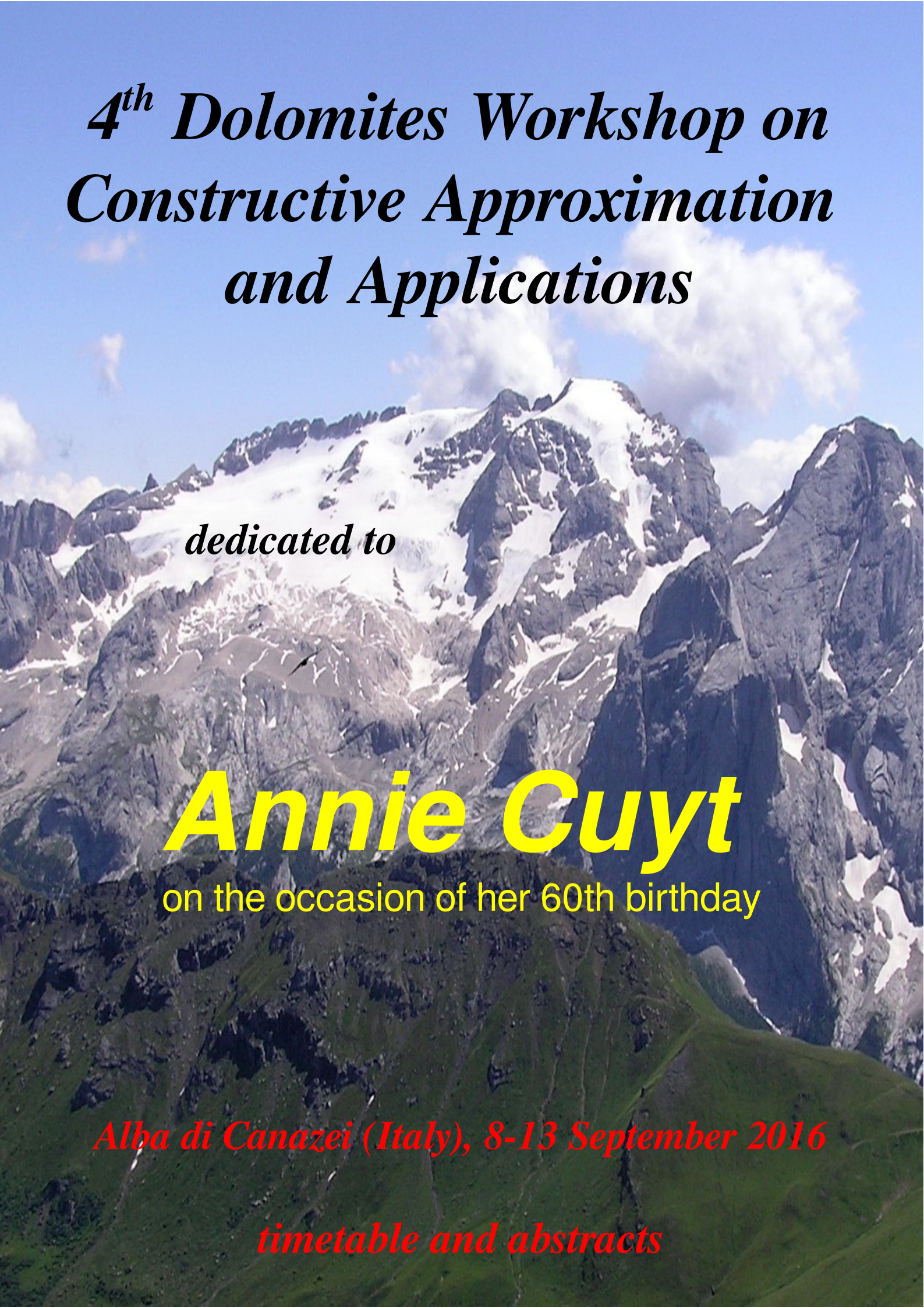




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timetable and abstracts

Analysis of the Allee threshold via Moving Least Square approximation.

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Abstract.

Cooperation is a common behavior between the members of predators species, because it can improve their skill in hunt, especially in endangered eco-systems. This behavior it is well known to induce the Strong Allee effect, that can induce the extinction when the initial populations' is under a critical density called "Allee threshold ". Here we investigate the impact of the pack hunting in a predator-prey system in which the predator suffers of an infectious disease with frequency and vertical transmission. The result is a three dimensional system with the predators population divided into susceptible and infected individuals. Studying the system dynamics a scenario was identified in which the model presents a bistability. However for a strong hunting cooperation the Allee threshold becomes almost zero, ensuring the survival of the predators.

Thus we present a study to analyze this critical density by considering the basins of attraction of the stable equilibrium points. This paper addresses the question of finding the point lying on the surface which partitions the phase plane. Therefore a Moving Least Square (MLS) method based on compactly supported radial functions has been adopted to reconstruct the separatrix manifold.

Keywords dynamical systems; predator-prey model; basins of attraction; meshless approximation.

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