1035-92-145 **Rossitza S Marinova*** (rossitza.marinova@concordia.ab.ca), 7128 Ada Boulevard, Edmonton, Alberta T5B 4E4, Canada. *Pedestrian Motion in Complex Geometries Using Nonlinear Dynamical Systems Approach.* Preliminary report.

Real situations like evacuation processes are characteristically complex, uncertain and immediate. These situations require that the planning and the execution phases function in parallel. For this reason biologically plausible and dynamic mathematical models are developing to perform dynamic local path planning in the multi-agent system. The methods are based on dynamical systems approach. The flexible microscopic simulation approach, used in our model, is based on the generalized force concept. Advantages of this approach are that we can take into account the flexible usage of space by pedestrians, requiring a (quasi-) continuous treatment of motion. Solving a set of time-dependent differential equations for bodies in three-dimensional Cartesian geometry with attracting and repelling potentials, determines the basic agent behavioral variables, such as heading direction and velocity. This creates a whole set of low-level behaviors, such as obstacle avoidance and target tracking. Resolving reactive behaviors on this level makes real-time simulation involving complex interactions between agents, the environment, and targets possible. Our dynamical systems model is validated using other established strategies in the fire prevention and protection field. (Received July 30, 2007)