

Nonlocal scalar conservation laws in the modeling of pedestrian traffic

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Abstract: In this talk, we are interested in the modeling of pedestrian traffic. In a macroscopic setting, we are led to consider a conservation law on the density of the pedestrians. A variety of models are possible through the choice of the pedestrian speed. Here, we assume the speed depends on the position of the pedestrian and on the local density, but also on the entire distribution of the pedestrians' density. More precisely, we assume the pedestrians' speed depends on the average of the density around a given point. If furthermore there are several populations, we must add as many equations as the number of different populations and we have to wonder how to modelize the interaction between the populations. On the analytical point of view, we have finally to deal with a system of conservation laws with a nonlocal flow.

I want here to present these models and study their properties, in particular, using either Kruzkov theory on scalar conservation laws or optimal transport tools, I will prove existence and uniqueness of weak solutions for these models.