Velocity waves in large-scale human crowds

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I will discuss the propagation of velocity waves in large-scale human crowds. Firstly, I will present a set of measurements performed on a number of different pedestrian crowds. I will demonstrate and quantitatively characterise longitudinal and non dispersive velocity waves propagating upstream the average pedestrian flow and show that transverse velocity fluctuations are strongly over damped. Secondly, I will show how to infer a predictive hydrodynamic description of some human crowds from their velocity wave spectra.

Figure 1: The starting line of the 2017 Bank of America Chicago Marathon