Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Flow shaping in wind tunnels with fan array technology GUILLAUME CATRY, NICOLAS BOSSON, GESHANTH VISVARATNAM, WindShape, FLAVIO NOCA, HEPIA / HES-SO University of Applied Sciences — In the past hundred years, wind tunnels have been built with the goal of generating uniform flows. In particular, the geometry of the contraction and the diffuser walls has to be carefully designed in order to achieve flat profiles in the test section and avoid boundary layer separation (both in the contraction and the diffuser). The resulting infrastructure has a large footprint and is generally unmodifiable during the whole the lifetime of the wind tunnel. We have developed a technology to shape the morphology of wind in space and time. It is based on a large number of fans (wind pixels), which are distributed arbitrarily in space and can be modulated individually. In particular, we show how this technology allows the wind profile in a test section to be controllable and does not require any *a priori* design of complex wind tunnel infrastructure

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Date submitted: 01 Aug 2019 Electronic form version 1.4