

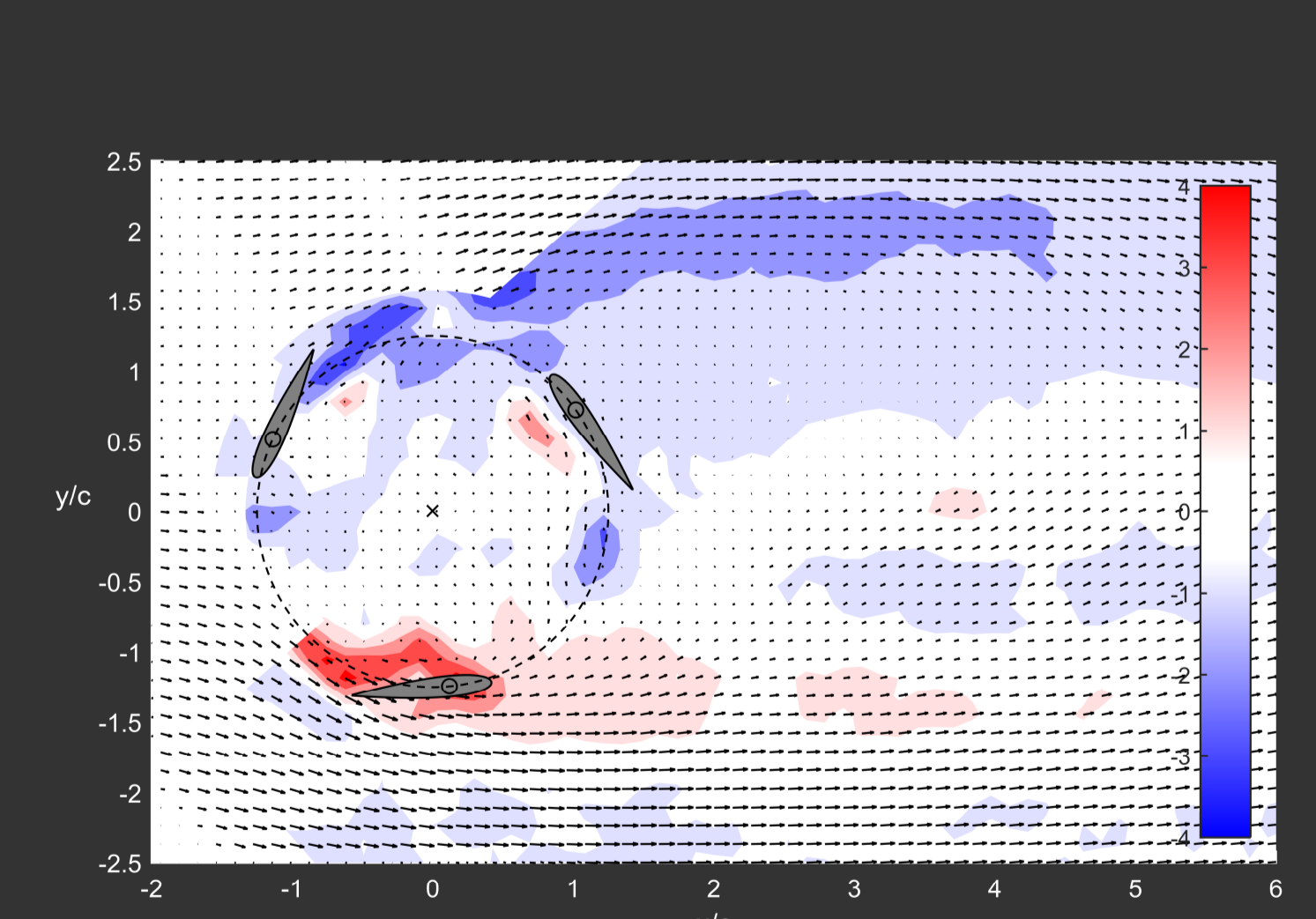
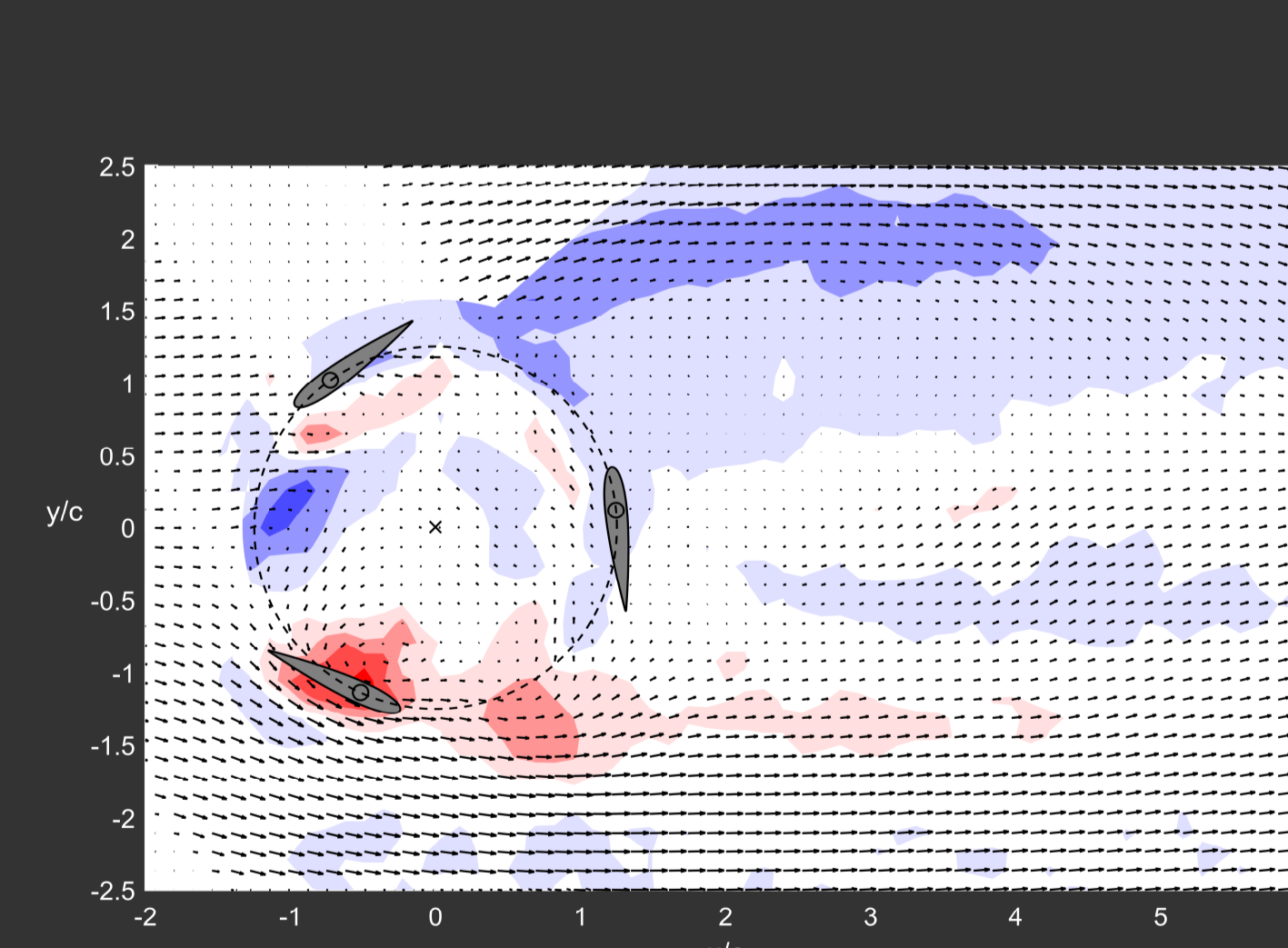
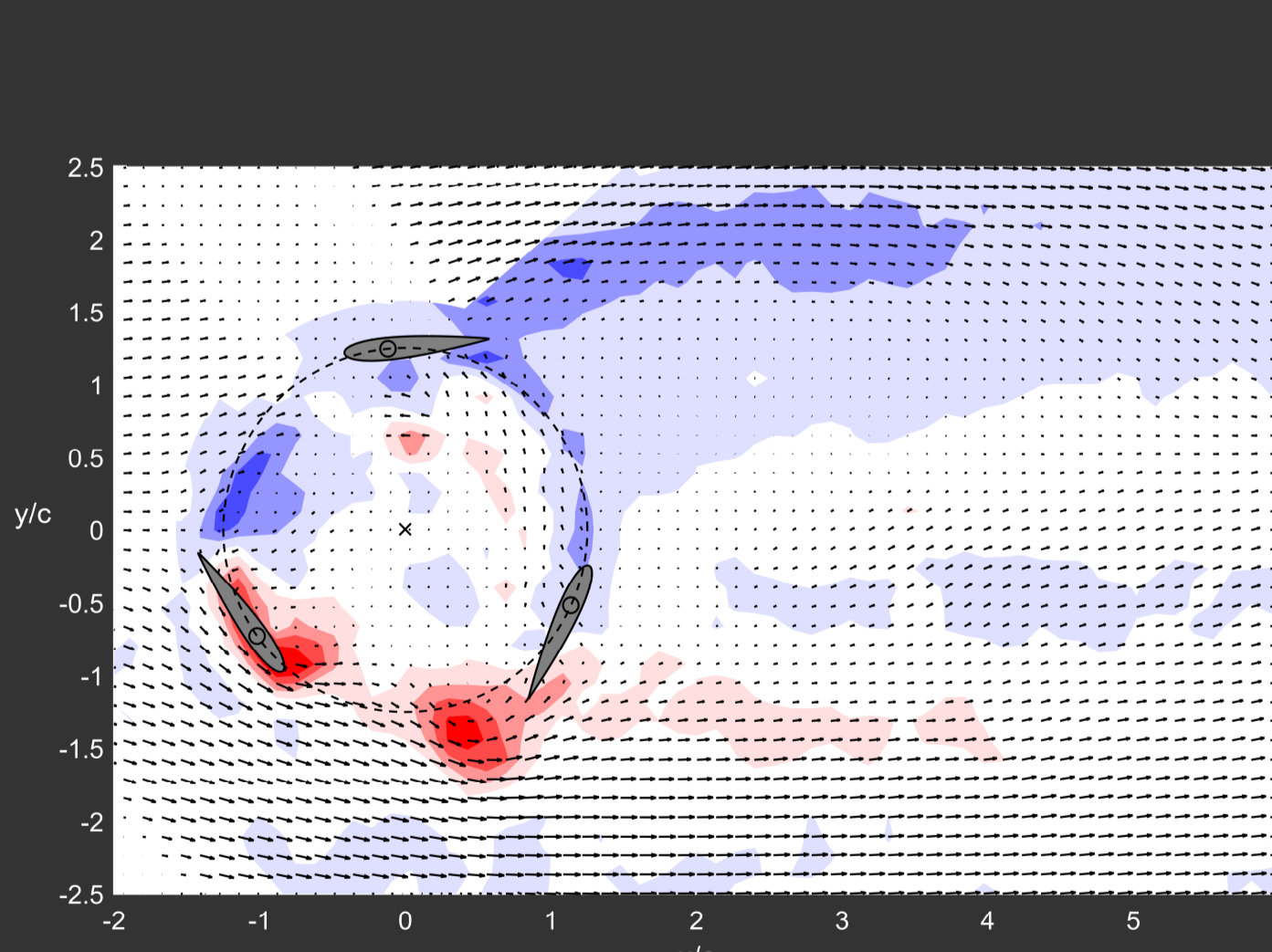
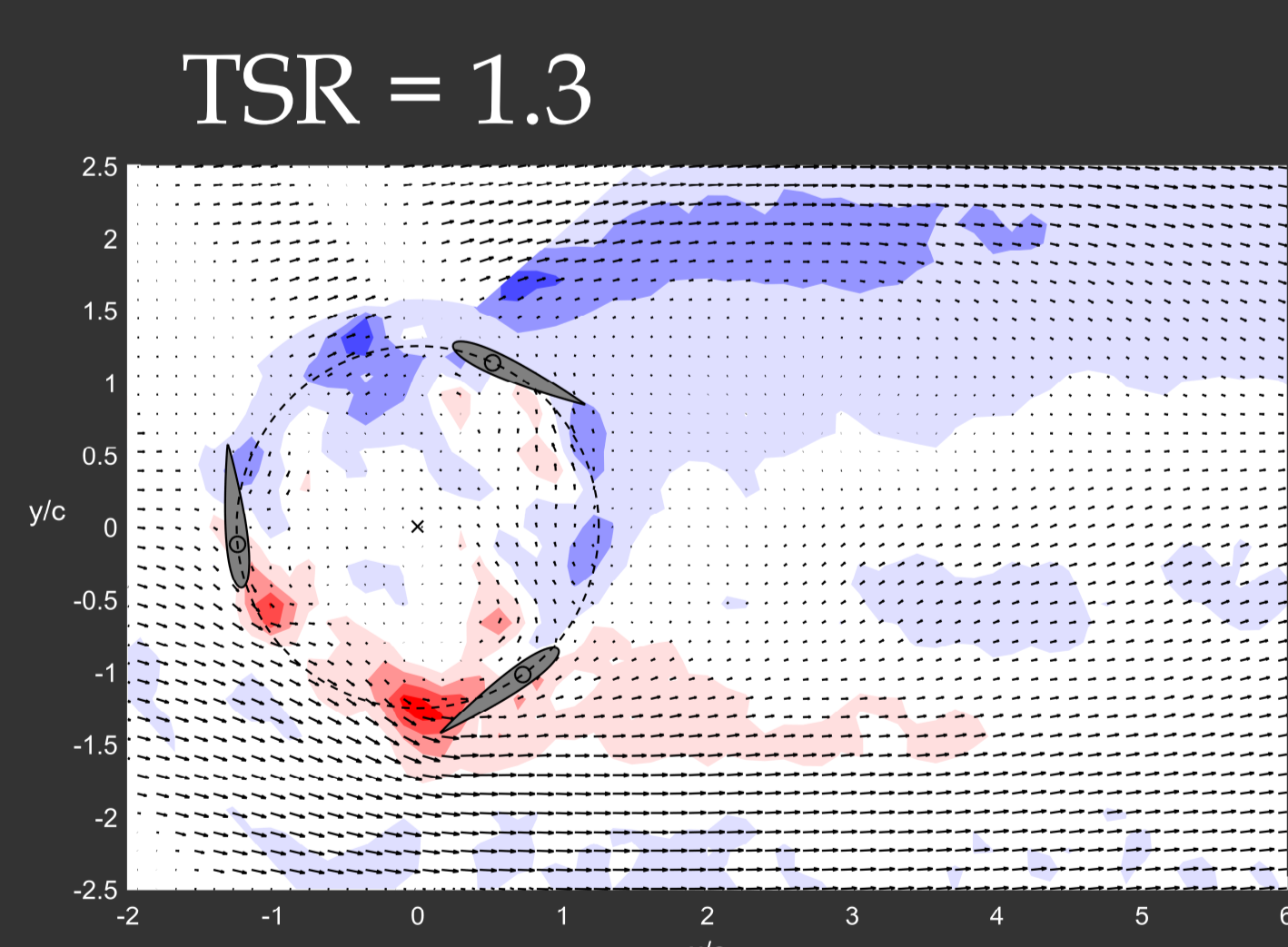
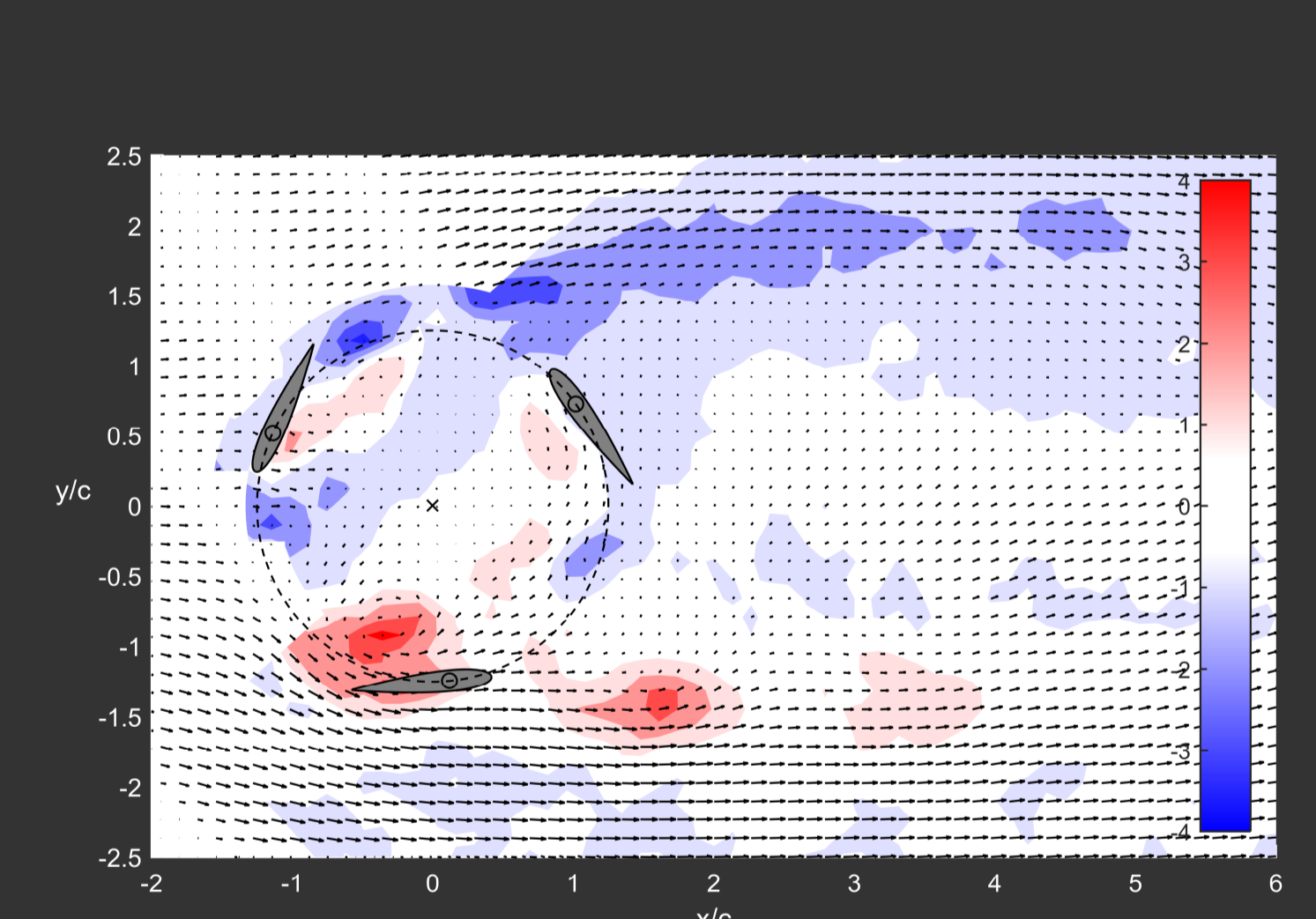
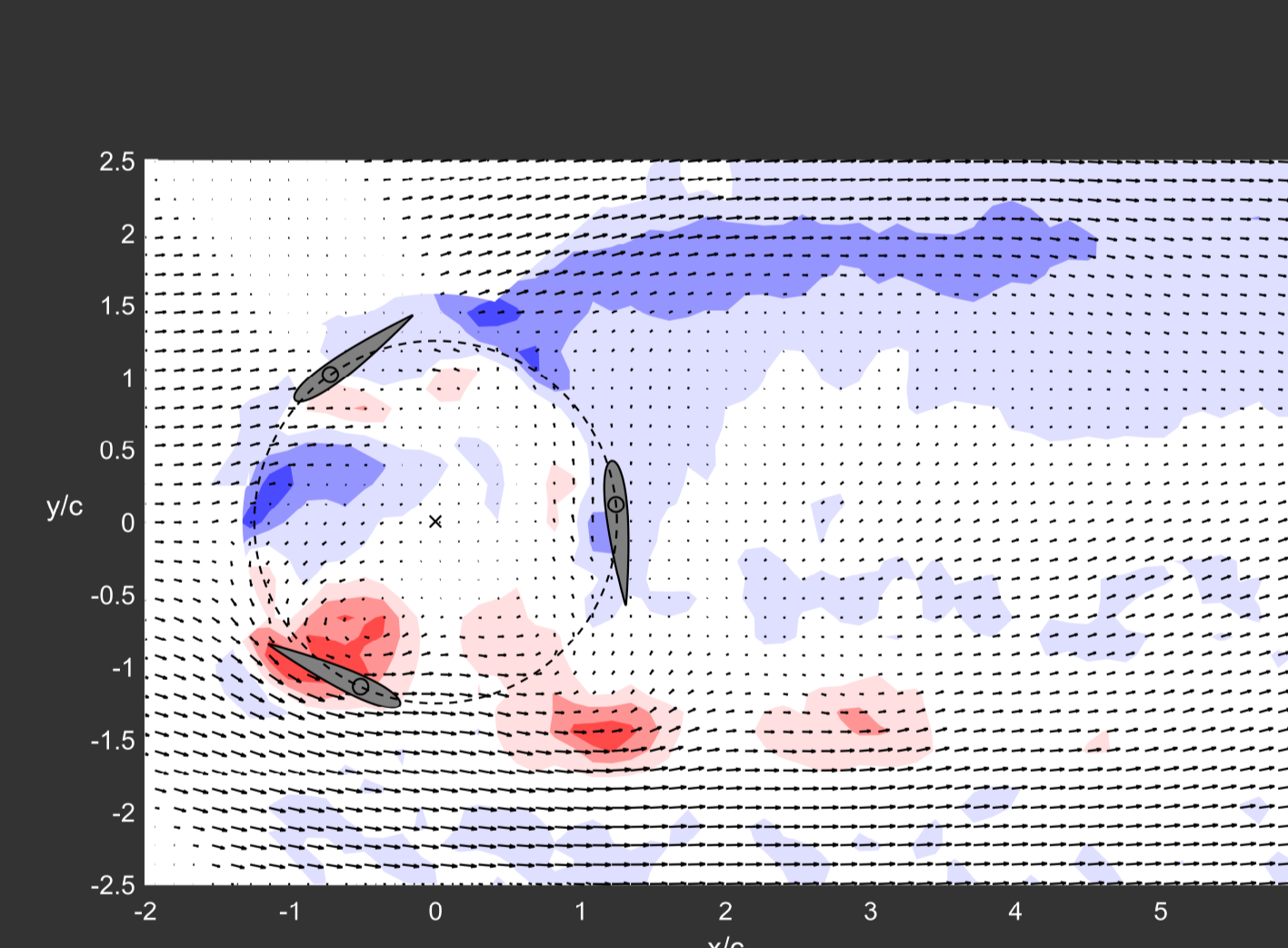
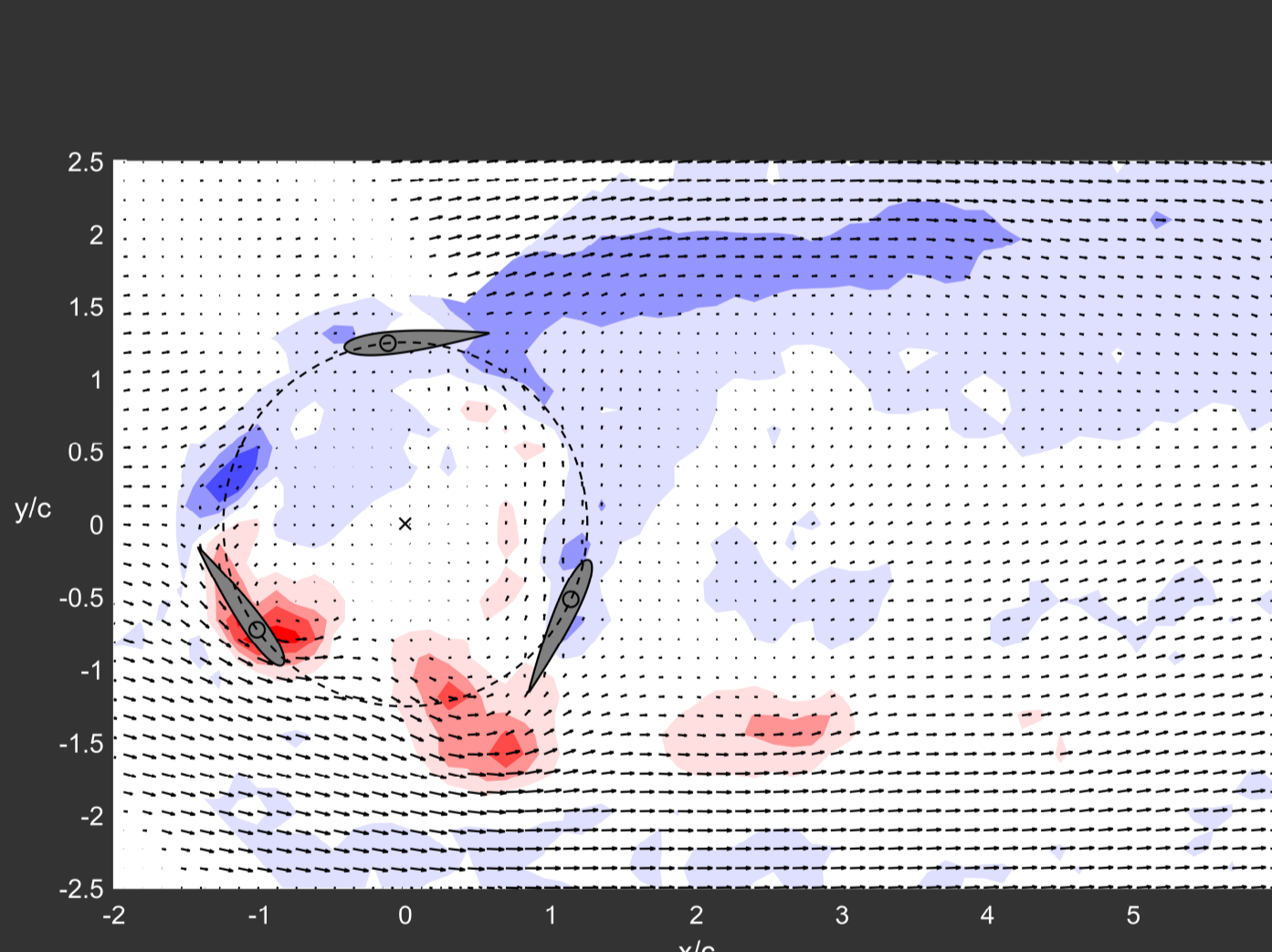
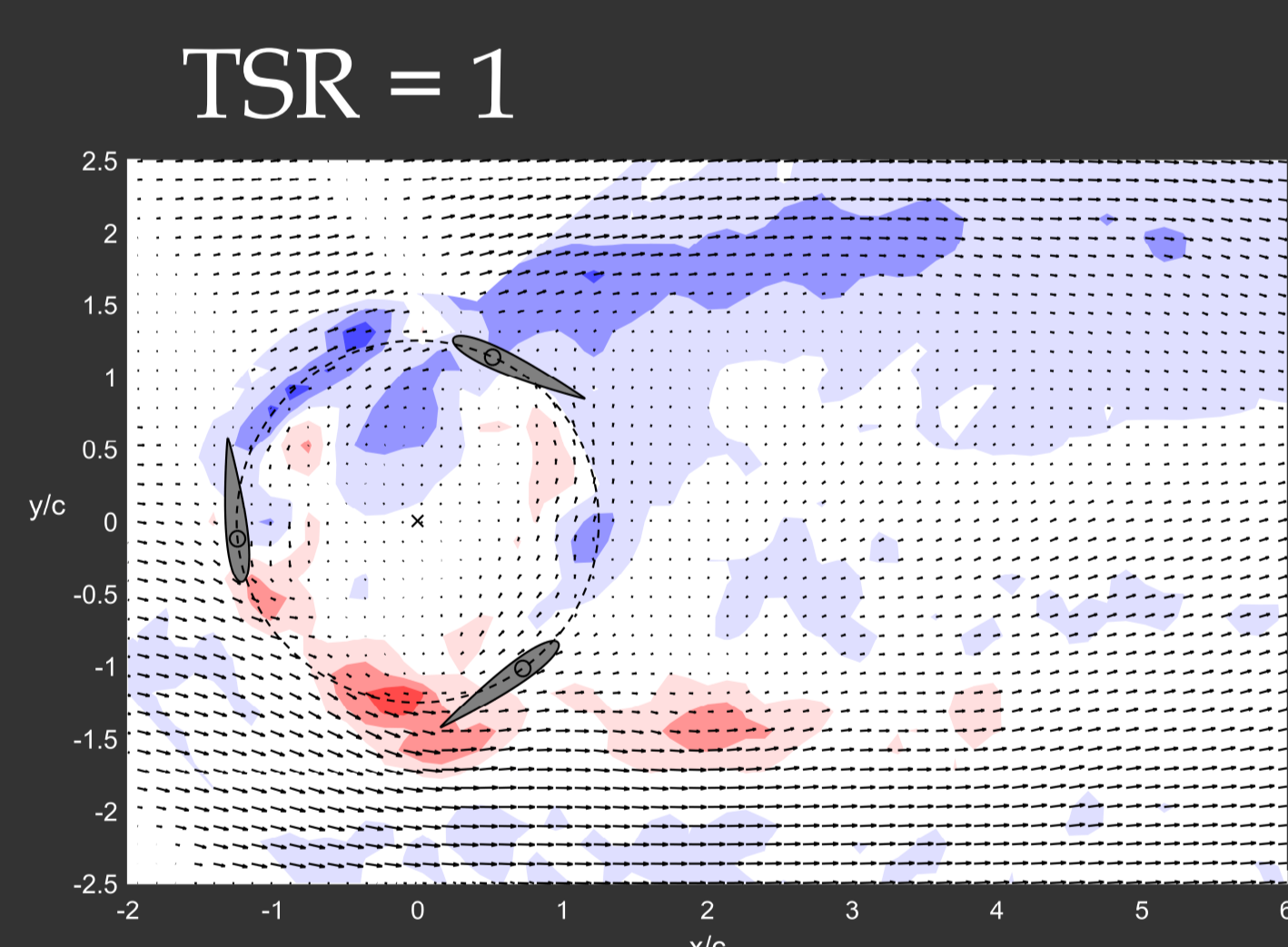
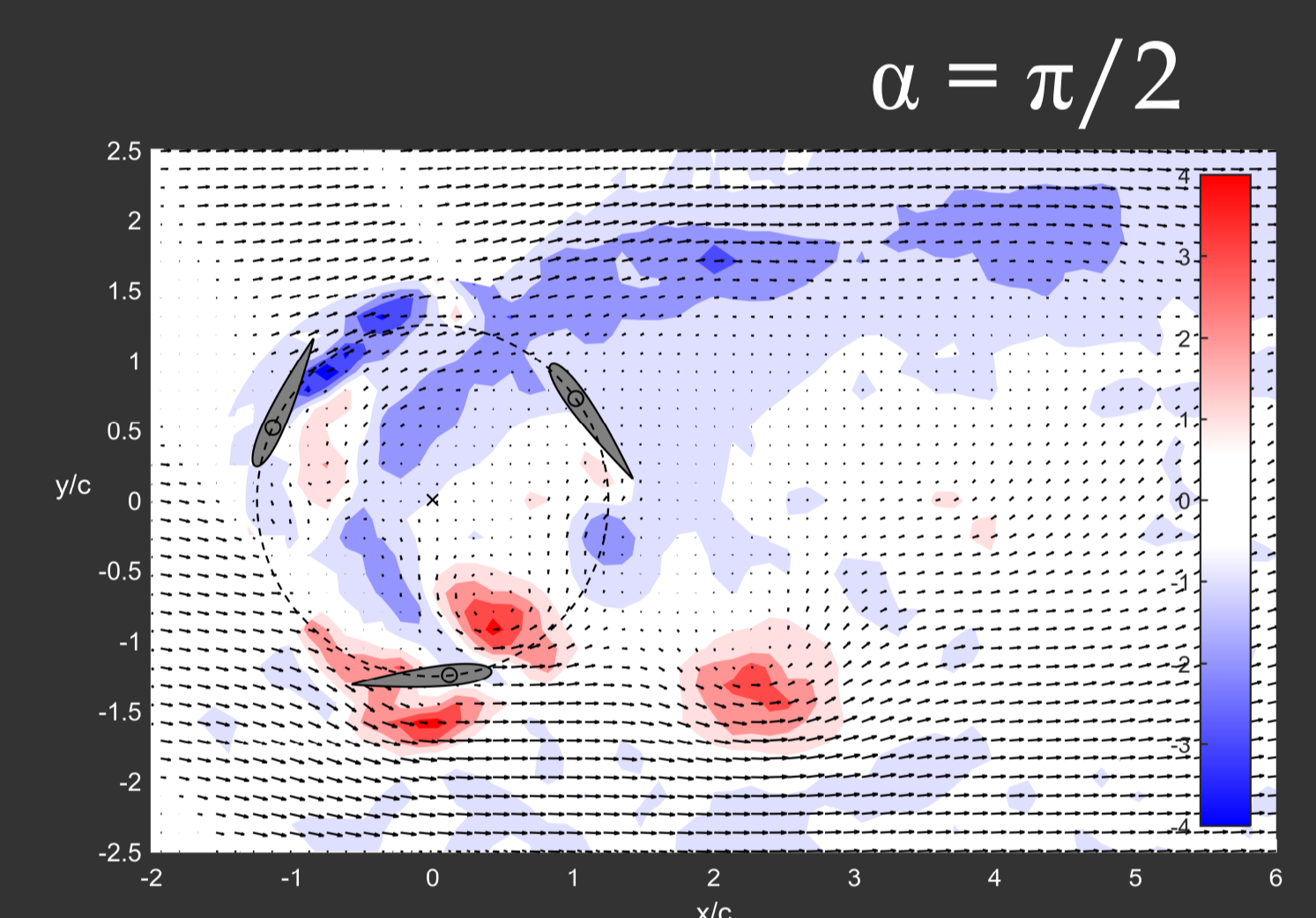
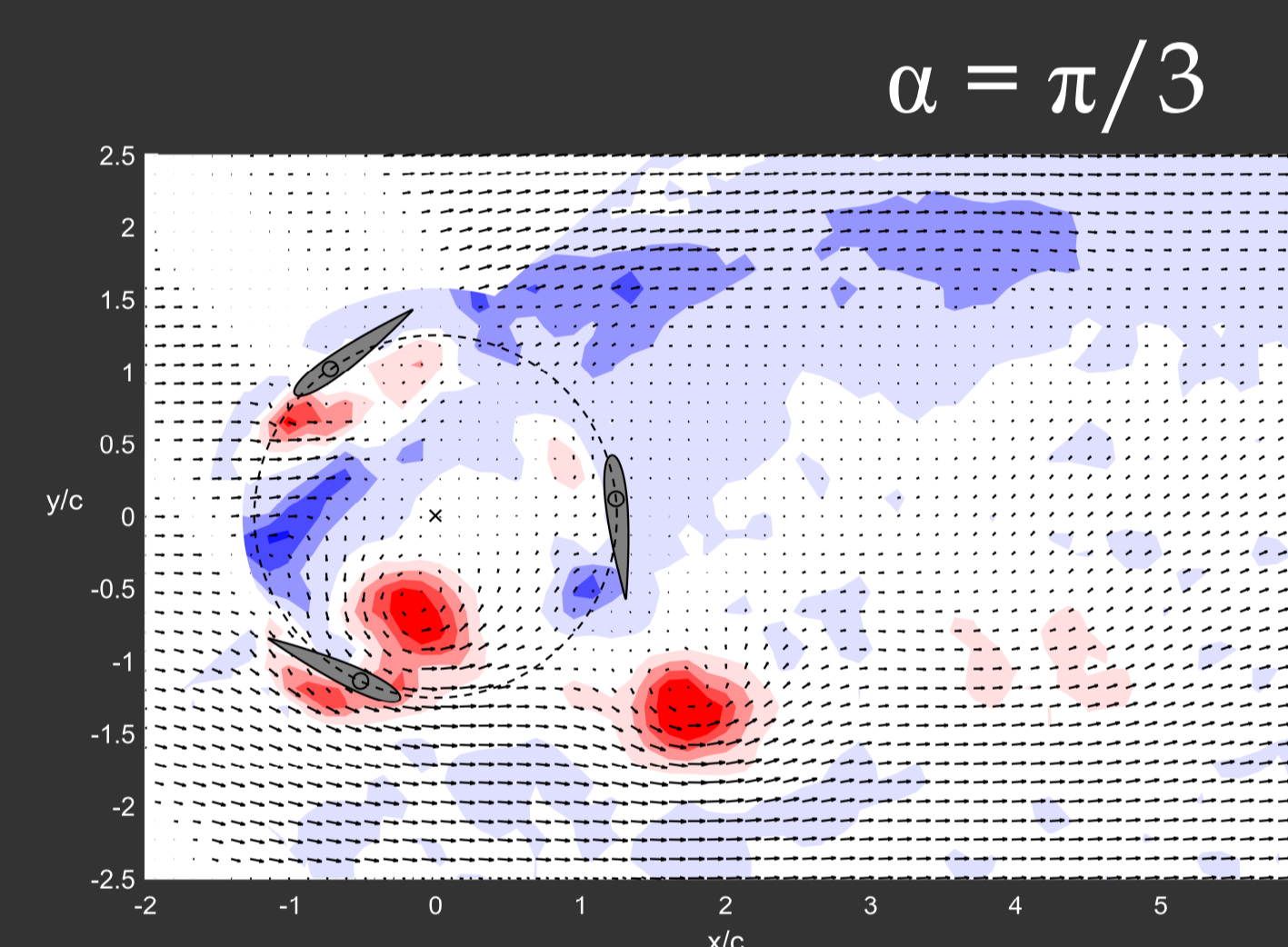
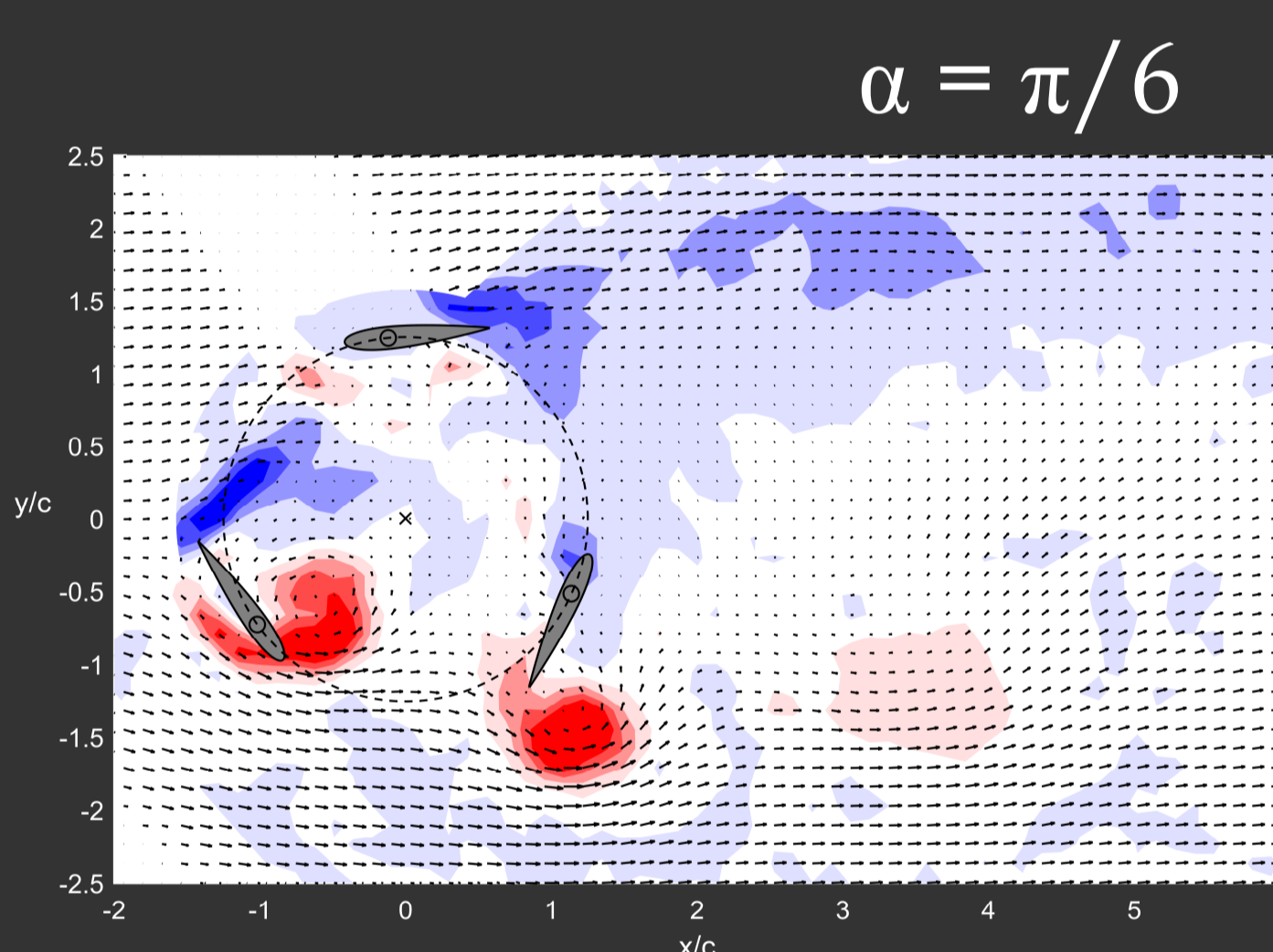
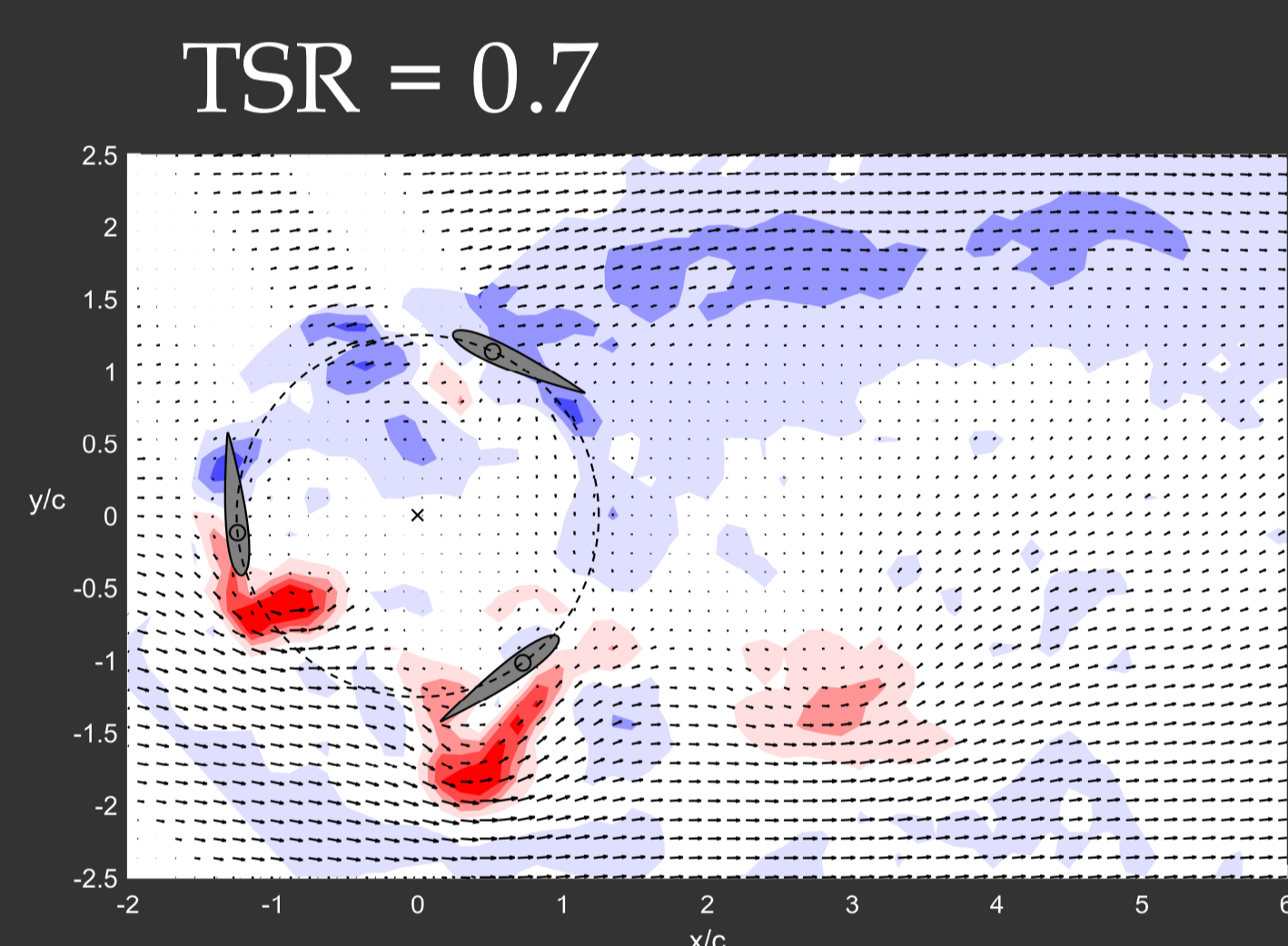
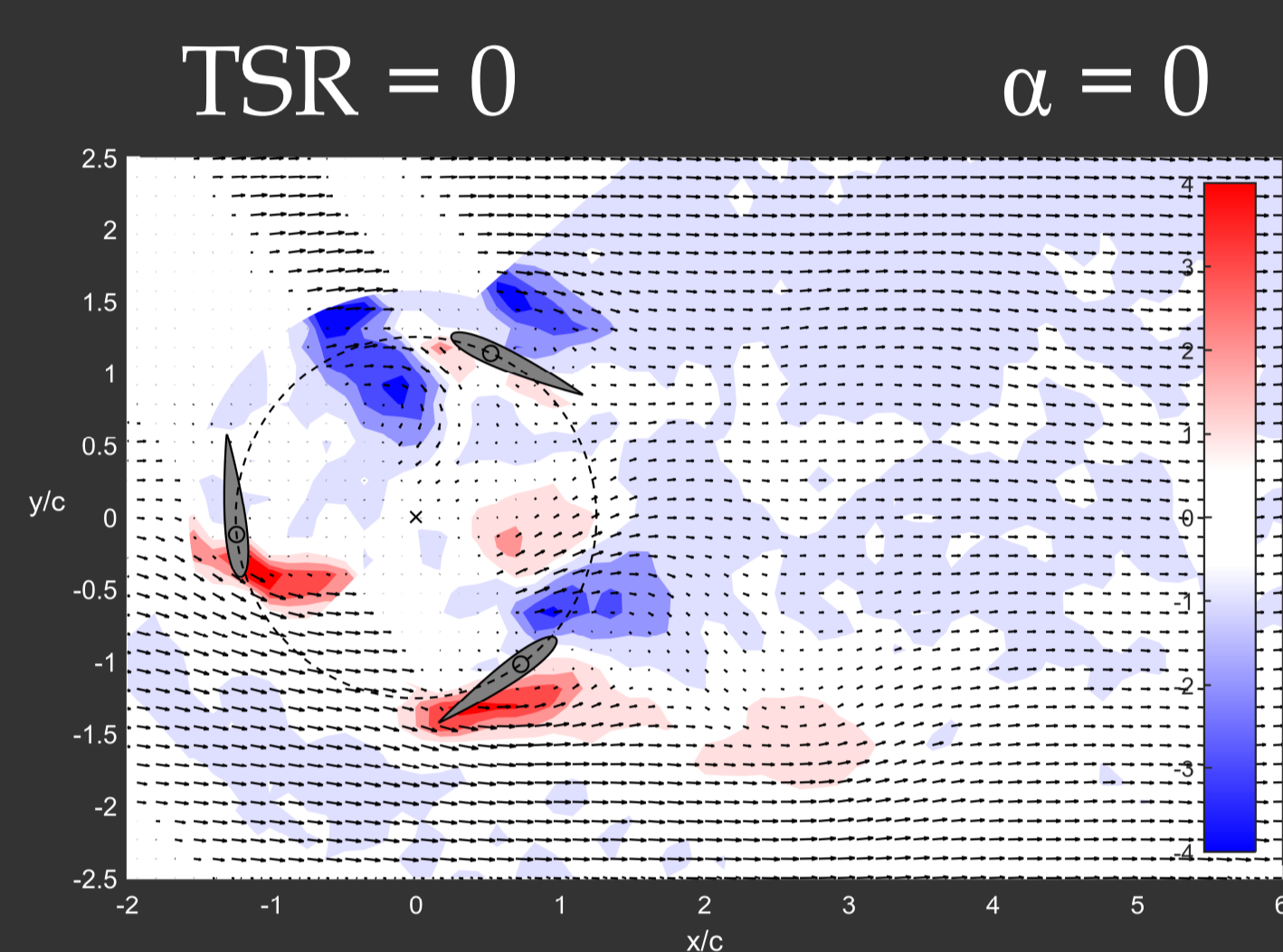
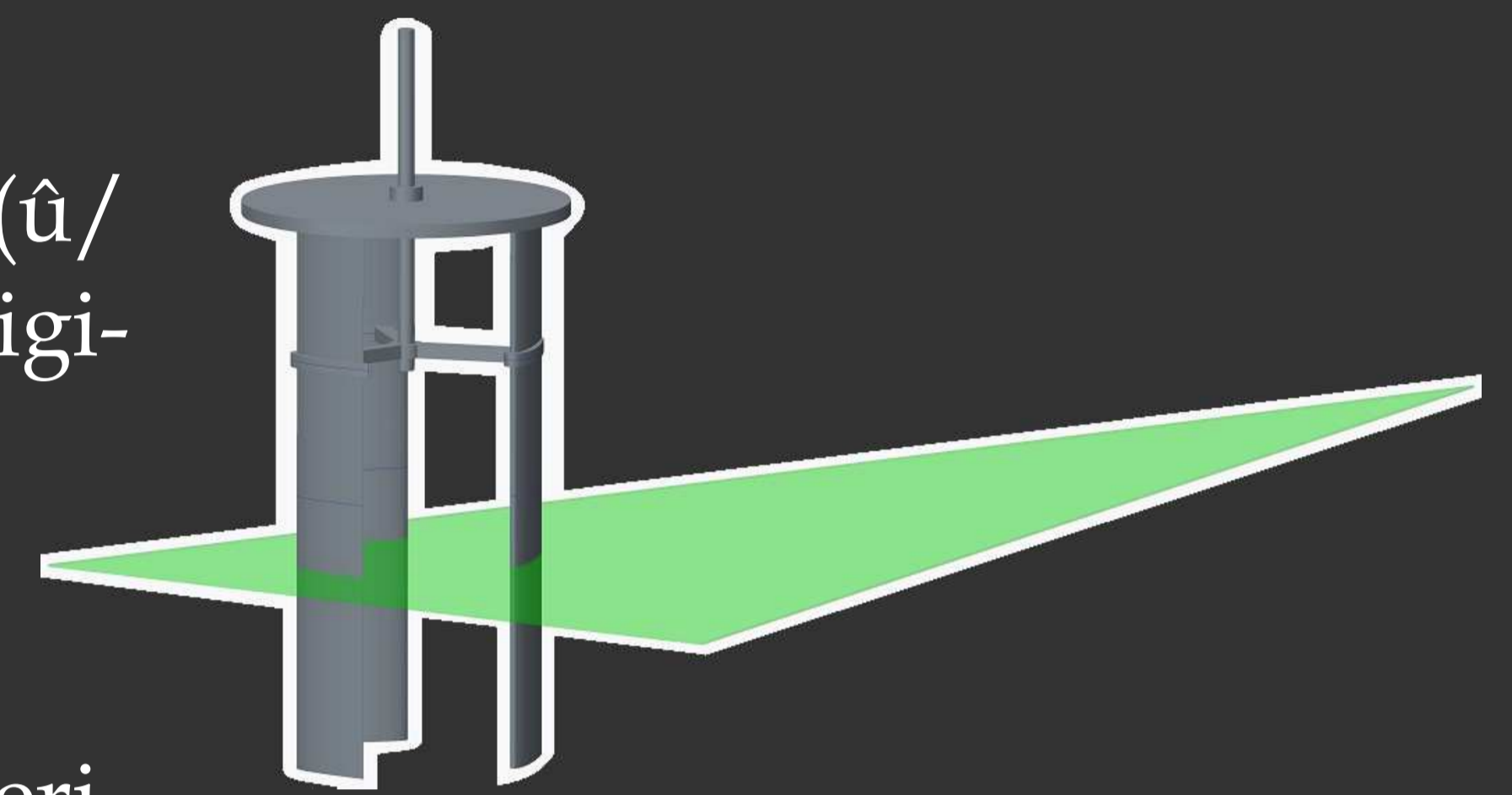
Planar velocimetry in the wake of a cross-flow turbine

Miguel Somoano¹ and Francisco Huera-Huarte¹

The cross-flow turbine model used in the experiments consists of three blades based on a constant NACA-0015 profile cantilevered, leading to a chord (c) to rotor diameter (D) ratio of 0.4. The tests were made by forcing the rotation of the turbine while being towed in a still water tank.

In the figures below we show phase averaged velocity (\hat{u}/u_∞) and vorticity ($\omega \cdot c/u_\infty$) fields obtained using planar Digital Particle Image Velocimetry (DPIV), in the wake of the turbine at a Reynolds number (Re) near 27500, and different tip speed ratios (TSR) set at 0, 0.7, 1 and 1.3.

The figure on the right shows an schematic of the experimental set-up where it can be seen how the DPIV laser sheet aimed at the mid span of the blades, illuminating the inner part of the rotor and the near wake of the turbine.



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