



## MECHANICAL ENGINEERING STUDENT SEMINAR

Wednesday, July 20 2022 at 13:30, D. Dan and Betty Kahn Building, Auditorium 1.

Online: <https://technion.zoom.us/j/4604890666>

### GPU Accelerated High-Fidelity Implicit LES of Coanda Cylinder Flow Instabilities

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The Coanda effect is the tendency of a fluid jet to attach and follow the contour of a nearby surface. This effect has various practical applications in aerodynamic design, such as active flow control around airfoils and rotor blades, as well as lift generation (for example in no-tail-rotor helicopters). This work entails the numerical study of flow around a Coanda cylinder- first for the case of a cylinder in a quiescent domain with the intent of capturing experimentally observed vortex structures; second for a cylinder in a freestream, with the intent of understanding the mechanisms effecting the lift generation around it. Numerical studies were performed using the open source solver PyFR, a high order Implicit Large Eddy Simulation (ILES) solver based on the Flux Reconstruction (FR) method. Simulations were performed for slot blowing momentum coefficients ranging from 0.04 to 0.08 with an inflow Reynolds number of 20,000 and 50,000 and for cylinders with single slot and double slot configurations. A noticeable increase in lift was observed at momentum coefficients higher than 0.04 and the double slot configuration has generated increased lift compared to a single slot for the same momentum coefficient. These trends agree with those observed in experiments done on a similar configuration.

Note: the seminar will be given in English