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Karol Cascavita is a PhD student at the Department of Mathematical Sciences at the Politecnico di Torino. Her research interests include advanced numerical methods as Virtual Element methods and Hybrid High Order methods. In particular, the aim is to develop advanced and innovative parallel numerical methods for solving large-scale complex physical models. The area of applications spans to real-world problems in fields such as fluid dynamics.

Introduction to the Virtual Element Method for the Stokes problem

ABSTRACT

The **Virtual Element Method** is nowadays considered to be an extension of the Finite Element Methods to more general meshes. The cornerstone is the ability to **build shape functions for general polygons**, allowing in turn to construct a robust method allowing the use of arbitrary polytopes and arbitrary polynomial order.

The use of the "virtual" label arises from the fact that **non-polynomial test/trial functions** can appear, whose closed-form in practice are not explicitly known and not even computed. This is possible by means of projections to polynomial spaces and the use of carefully selected degrees of freedom. In this talk, I will give a quick introduction to the VEM, specifically applied to the Navier-Stokes problem, and I will provide some hints of how to build the method in its algebraic realization.