Basic Principles of Mixed Virtual Element Methods

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We present, in the simplest possible way, the extension of the Virtual Element Method to the discretization of $H(div)$-conforming vector fields. As we shall see, the methods presented here can be seen as extensions of the so-called BDM family to deal with more general element geometries (such as polygons with an almost arbitrary geometry). For the sake of simplicity, we limit ourselves to the 2-dimensional case, with the aim of making the basic philosophy clear. However, we consider an arbitrary degree of accuracy k (the Virtual Element analogue of dealing with polynomials of arbitrary order in the Finite Element Framework). Preliminary numerical results are presented.