High resolution interface representation using finite element methods on triangles

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In this talk, we present a finite element approach which assures the representation of an interface with high accuracy. We explicitly allow an interface to cut through mesh cells. With a local interpretation of degrees of freedom we recover second order of convergence in L^2 for an elliptic test problem with a discontinuous coefficient.

In order to prove a priori error estimates, we will need a maximum angle condition to be satisfied. In contrast to the case of quadrilateral cells, the case of triangular cells is more involved and will also be discussed in this talk.