A discrete duality finite volume method on non-convex domains

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Abstract: We consider a diffusion problem on a polygonal domain presenting a reentrant corner and use a discrete duality finite volume method to solve it. In order to compensate for the loss of regularity of the solution near the nonsmooth part of the boundary, we introduce a refinement of the grid at the reentrant corner. This technique allows to restore the optimal order of convergence. This work is originated from a collaboration with the swiss weather prediction service MeteoSwiss, we thus restrict ourselves to a specific grid and compare two ways to refine it.