

# Non-matching Multi-patch Discretizations in Finite Element Exterior Calculus and their Implementation in Psydac

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Having a multi-patch discretization with coarse and more refined patches allows for a well suited treatment of domains that need high resolution in certain places, for example the re-entrant corner of a L-shaped domain. Although this approach is widely used in numerical schemes, its application in Finite Element Exterior Calculus (FEEC) methods is virtually nonexistent, mostly because of the inherent conformity requirement of the finite element fields in FEEC theory. In this talk we will describe some of the difficulties posed by the extension of FEEC schemes to non-matching multi-patch meshes, and propose a novel approach that consists of properly coupling patch-wise FEEC discretizations, together with its implementation in the Psydac library.