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We propose an adaptive isogeometric method for the numerical approximation of (high order) partial differential equations defined on multi-patch surfaces. By focusing on  $C^1$  hierarchical spline constructions, we will present a refinement algorithm with linear complexity which guarantees the construction of suitably graded hierarchical meshes that fulfill the condition for linear independence of the hierarchical basis. A selection of numerical examples will confirm the potential of the adaptive scheme on different multipatch configurations.

*Joint work with Cesare Bracco (University of Florence, Italy), Andrea Farahat (RICAM, Austria), Mario Kapl (Carinthia University of Applied Sciences, Villach, Austria), Rafael Vázquez (EPFL, Lausanne, Switzerland).*