Title: Generalized Optimised Schwarz Method for arbitrary non-overlapping sub-domain partitions

Abstract: This talk will focus on substructuring domain decomposition (DDM) for wave propagation in harmonic regime. We shall discuss a recently introduced variant of the Després algorithm where transmission conditions are formulated in terms of ingoing/outgoing traces. As a novel ingredient, coupling between subdomains is enforced by means of a so-called communication operator which is a priori (but not systematically) non-local. This new approach can cope with arbitrarily shaped subdomain partitions with possible presence of cross points, and a full convergence framework is available. The choice of impedance matrices appearing in ingoing/outgoing traces has a strong impact on the convergence rate, which can be precisely quantified by our theory, and also dictates the definition of the communication operator. In spite of the guaranteed convergence of the global DDM algorithm, the communication operator may induce additional computational cost and, in the perspective of parallel computation, a careful study of this operator appears strategic. We shall present recent progress in this direction after a detailed presentation of our DDM algorithm.