# Exact recovery conditions for sparse representations with partial support information

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In this talk, we will elaborate on a new sparse representation paradigm where some partial information on the support of the sought vector is available at the decoder. This new perspective of  the sparse representation problem has recently emerged in several application domains in which sparse vectors, with strongly correlated supports, have to be estimated from a few measurements. Examples of such applications include for instance Tomo-PIV problems where the position of particles (sparsely) seeded in a turbulentuid have to be recovered at several successive time instants, real-time MRI reconstruction, real-time video compression/decompression, etc. Most of the approaches proposed so far in the literature focus, both at theoretical and practical points of view, on methodologies based on the minimization of an l1 norm. In this talk, we will provide several conditions applying to lp-based decoders (p between 0 and 1) and greedy algorithms (e.g., orthogonal matching pursuit and orthogonal least square). The proposed conditions will be shown to be sufficient and worst-case necessary (in some sense) for the success of the considered algorithms. We will moreover emphasize that the conditions derived within this general framework generalize those available in the literature for the non-informed case.