

# Input reconstruction for a class of Input-Output distributed systems

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We consider an input-output distributed system with colocated inputs and outputs. The goal is to reconstruct the input  $u$  in “real time”; i.e. at each time instant we want an approximant  $v(t)$  of  $u(t)$  which is obtained solely on the basis of observations taken at previous times. We shall prove that this goal is achievable, under suitable assumptions, using a method first introduced by Osipov in the case that the full state is observed.

The assumptions we introduce essentially boils down to assume that the system is of parabolic type. We present however two sets of assumptions, in state space form and in frequency domain form. It turns out that assumptions expressed in frequency domain are more flexible and allows the consideration of a larger class of input/output operators.