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Time-Variant System Approximation via Later-Time Samples. Preliminary report.

We propose a reconstruction algorithm for a time-variant system $u = u(x, t)$ from its later-time samples at a single spatial location x_0 . We construct a sequence of approximations of the unknown initial state $u(x, 0)$ and, as a consequence, of all later-time states. We show that a careful selection of the sequence of later-time samples $\{u(x_0, t_j)\}_{j \geq 1}$ provides for good convergence rates. Applications include approximations of solutions to special classes of linear evolutionary PDEs. (Received September 15, 2019)