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A third order (in time) PDE: a view from the boundary, to control and to observe.

We shall consider a third order (in time) PDE that arises in many applications in different fields. The emphasis is a study of its behavior from the boundary of the bounded domain in which it evolves: optimal interior and boundary regularity with Dirichlet or Neumann non-homogeneous term (control); corresponding boundary control problems; inverse problems with boundary observation. Thus, the forcing term/observation is non-invasive. Different problems dictate different math techniques: semigroups methods for homogeneous BC; energy methods (differential in the non-homogeneous Dirichlet boundary case and pseudo-differential/microlocal analysis in the non-homogeneous Neumann boundary case) for optimal interior and boundary regularity; Carleman-type estimates for boundary control and inverse problems from the boundary.