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**Ricardo Salazar\*** ([rsalazar@math.ucla.edu](mailto:rsalazar@math.ucla.edu)), 520 Portola Plaza, Math Sciences Building 6363, Los Angeles, CA 90095. *Determination of time-dependent coefficients for a hyperbolic inverse problem.* Preliminary report.

We consider an inverse boundary value problem for the hyperbolic partial differential equation

$$(-i\partial_t + A_0(t, x))^2 u(t, x) - \sum_{j=1}^n (-i\partial_{x_j} + A_j(t, x))^2 u(t, x) + V(t, x)u(t, x) = 0$$

with time dependent vector and scalar potentials ( $\mathcal{A} = (A_0, \dots, A_m)$  and  $V(t, x)$  respectively) on a bounded, smooth cylindric domain  $(-\infty, \infty) \times \Omega$ . Using a geometric optics construction we show that the boundary data allows us to recover integrals of the potentials along ‘light rays’ and we then establish the uniqueness of these potentials modulo a gauge transform. (Received April 14, 2010)