

# Inverse problems of determining moving sources in diffusion equations

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Let  $\Omega \subset \mathbb{R}^n$  be an open bounded domain with smooth boundary  $\partial\Omega$ . We consider

$$\partial_t u(x, t) = \Delta u(x, t) + f(x - \alpha(t)), \quad x \in \Omega, 0 < t < T.$$

Let  $\Gamma \subset \partial\Omega$  be an arbitrary subboundary, and  $\alpha$  be given. Our main inverse problem is

## **Inverse moving source problem.**

Determine  $f(x)$  by  $u, \nabla u$  on  $\Gamma \times (0, T)$ .

We discuss the uniqueness and the stability for the inverse moving source problem.

One of the main results is the uniqueness in determining  $f$ , provided that unknown  $f$  has compact supports.

This is a joint work with Professor Piermarco Cannarsa (Università degli Studi di Roma "Tor Vergata") and Professor Giuseppe Floridia (Università degli Studi di Napoli Federico II).