Abstract: Consider the one-dimensional heat process in a finite length rod, where the heat source is proportional to the temperature distribution
\[
\begin{cases}
  u_t(x, t) = u_{xx}(x, t) - q(x)u(x, t), & 0 \leq x \leq 1, \quad t > 0, \\
  u(0, t) = 0, \\
  u(1, t) = a(t), \\
  u(x, 0) = 0.
\end{cases}
\] (1)

We are concerned with the recovery of the heat coefficient \(q(x)\) from the measurement of \(u_x(1, t) = b(t)\), which is the heat flux at one end of the rod. Let \(u(1, t) = a(t)\) be a nontrivial, nonnegative, and continuously differentiable function with compact support on \((0, T)\). We will show that a single measurement of \(u_x(1, t) = b(t)\) either on \((T, T_1)\) or at \(t = 1, 2, \cdots\) determines \(q(x)\) uniquely.

This is a joint work with Dr. Amin Boumenir.

All are welcome.