REGULARIZATION METHODS FOR SIMULTANEOUSLY DETERMINING OF UNKNOWN SOURCES IN A PARABOLIC EQUATION

F. Rebbani [1], **N. Boussetila** [2]

[1] Applied Math Lab, University Badji Mokhtar-Annaba, P.O.Box 12, Annaba 23000, Algeria
rebbani@wissal.dz

[2] Department of Mathematics, University 08 Mai 45-Guelma, P.O.Box 401, Guelma 24000, Algeria
n.boussetila@gmail.com

In this talk we consider an inverse problem of simultaneously finding unknown sources f, g and function $u(t)$ that satisfy the equation:

$$u'(t) + Au(t) = f, \quad 0 < t < T_2, \quad u(0) = g, \tag{1}$$

and the additional specifications:

$$\mathcal{B}_1(u) = u(T_1) = \varphi_1, \quad \mathcal{B}_2(u) = u(T_2) = \varphi_2, \tag{2}$$

where A is a self-adjoint positive definite linear operator with dense domain $D(A)$ in the Hilbert space H, φ_1 and φ_2 are two known functions in H.

Problem (1), (2) is not well-posed in the sense of Hadamard. In this work, we will use the quasi-boundary-value method to form an approximate non-local problem depending on a small parameter α. We show that the approximate problem is well-posed, and the convergence of this method.