

Stability and convergence results for an inverse problem for the waves

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I will present some recent works with Lucie Baudouin and Axel Osses regarding the question of convergence of space semi-discrete inverse problems toward their continuous counterpart. More precisely, I will focus on the inverse problem consisting in recovering a potential in the wave equation from a measurement of the flux on the boundary. In the continuous setting, several uniqueness and stability results are available in the literature, and in particular a Lipschitz stability result under the multiplier condition obtained by Imanuvilov and Yamamoto, and a logarithmic stability result obtained by Bellassoued when no geometric condition is satisfied. In both situations, we will design a numerical process for which convergence results are proved. In both cases, our analysis is based on discrete Carleman estimates, either for the waves or for the elliptic operator, in which case we shall use the results of Boyer, Hubert and Le Rousseau.