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## **Non-uniform stability of a class of skew-adjoint control systems**

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**Abstract:** In this talk, we are interested in the stability of a class of infinite dimensional systems associated with skew-adjoint operators. This is motivated by the control problem of a linear water waves system and its eigenvalues do not satisfy the gap conditions, which are generally used to establish controllability and stabilizability properties in this kind of situation. To obtain the explicit decay rate, we make the assumptions, which are clearly and easily verified, on the spectrum structure of the evolution operators involved in the control system. The key point is to describe the distance of the eigenvalues and to estimate the upper bound of the norm of the resolvent operator. We obtain an explicit non-uniform decay rate of the energy in two cases, provided that the initial data is smooth. Finally, we introduce the application of this abstract result to a fractional wave equation and a water waves system, as well as a floating body system. This is collaborated with M. Tucsnak (Université de Bordeaux).