ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

B. Buffoni – B. Dacorogna – J. Krieger – M Nguyên – Section Mathématiques

SEMINAIRE D'ANALYSE

- ***VENDREDI 13 JANVIER 2017 à 14h15 - salle MA A1 12***

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Professeur **Fioralba Cakoni** (Rutgers University, USA) donnera une conférence sur le thème:

« Eigenvalue Problems in Inverse Scattering Theory for Inhomogeneous Media »

Abstract In the recent years there has been considerable interest in the transmission eigenvalue problem associated with the scattering by an inhomogneous media. Transmission eigenvalues are related to nonscattering frequencies, they can be determined from the scattering operator and carry information about the refractive index of the scattering medium. However the use of transmission eigenvalues in nondestructive testing has two drawbacks. The first drawback is that in general only first few transmission eigenvalues can be accurately determined from the measured data and the determination of these eigenvalue means that the frequency of the interrogating wave must be varied in a frequency range around these eigenvalues. In particular, multifrequency data must be used in an a priori determined frequency range. The second drawback is that only real transmission eigenvalues can be determined from the measured scattering data which means that transmission eigenvalues cannot be used for nondestructive testing of inhomogeneous absorbing media. In our presentation we show how to overcome these difficulties by modifying the far field operator (or the scattering operator). Properties of the modified far field operator are linked to new eigenvalue problems, such as the Steklov eigenvalue problem or a different version of the transmission eigenvalue problem. The key idea is that, as oppose to transmission eigenvalues, the eigenvalue parameter in these problems is not related to interrogating frequencies. Nevertheless, these new eigenvalues (possibly complex) can still be determined from scattering data and hence can be used to determine changes in the refractive index of more general type of inhomogeneous media.

Lausanne, le 9 janvier 2017
BD/HMN/MM

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