



香港中文大學
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FIRST IN
CHANGE

Analysis and PDE Seminar

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TITLE: Linear stability of solitary waves for the Euler-Poisson system

Date : November 11th, 2021 (Thursday)

Time : 10am-11am (Hong Kong time)

11am-12noon (Korea time)



Link to ZOOM : <https://unist-kr.zoom.us/j/3170659442>

Meeting ID : 317 065 9442

Password : APDE21

Abstract. We study the asymptotic linear stability of a two-parameter family of solitary waves for the isothermal Euler-Poisson system. When the linearized equations about the solitary waves are considered, the associated eigenvalue problem in L^2 space has a zero eigenvalue embedded in the neutral spectrum, i.e., there is no spectral gap. To resolve this issue, use is made of an exponentially weighted L^2 norm so that the essential spectrum is strictly shifted into the left-half plane, and this is closely related to the fact that solitary waves exist in the super-ion-sonic regime. Furthermore, in a certain long-wavelength scaling, we show that the Evans function for the Euler-Poisson system converges to that for the Korteweg-de Vries (KdV) equation as an amplitude parameter tends to zero, from which we deduce that the origin is the only eigenvalue on its natural domain with algebraic multiplicity two. We also show that the solitary waves are spectrally stable in L^2 space. Moreover, we discuss (in)stability of large amplitude solitary waves.

All are welcome

This is a joint activity organized by Department of Mathematics, The Chinese University of Hong Kong, Hong Kong; Department of Mathematics, Institute of Mathematical Research, Research Division of Mathematical and Statistical Science, The University of Hong Kong, Hong Kong; and Department of Mathematical Sciences, Ulsan National Institute of Science and Technology, Korea. More details can be found in https://hkumath.hku.hk/~imr/event/CUHK_HKU_UNIST_Analysis_and_PDE/index.php.

