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# Analysis and PDE Seminar

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TITLE: On steady states for the Vlasov-Schrödinger-Poisson system

*Date* : Oct 27th, 2022 (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.** The Vlasov-Schrödinger-Poisson system is a kinetic-quantum hybrid model describing quasi-lower dimensional electron gases. For this system, we construct a large class of 2D kinetic/1D quantum steady states in a bounded domain as generalized free energy minimizers, and we show their finite subband structure, monotonicity, uniqueness and conditional dynamical stability. Our proof is based on the concentration-compactness principle, but some additional difficulties arise due to lack of compactness originated from the hybrid nature. To overcome the difficulties, we introduce a 3-step refinement of a minimizing sequence by rearrangement and partial minimization problems, and the coercivity lemma for the free energy is crucially employed. This talk is based on joint work with Sangdon Jin (Chung-Ang University).

*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](https://hkumath.hku.hk/~imr/event/CUHK_HKU_UNIST_Analysis_and_PDE/index.php).

