

**The Hong Kong Polytechnic University  
Department of Applied Mathematics**

**Seminar**

**Local error estimation and step size control in adaptive linear multistep methods**

**By**

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**Abstract**

In a  $k$ -step adaptive linear multistep methods the coefficients depend on the  $k-1$  most recent step size ratios. In a similar way, both the actual and the estimated local error will depend on these step ratios. The classical error model has been the asymptotic model based on a constant step size analysis, where all past step sizes simultaneously go to zero. This does not reflect actual computations with multistep methods, where step size control only affects future steps, not the the previous accepted steps. In variable step size implementations, therefore, even in the asymptotic regime, the error model must include the dependence on previous step sizes and step ratios. In this talk we develop dynamic asymptotic models for variable step size computations, and analyze a new step size controller accounting for the dynamics in the error model, while keeping the local error near a prescribed tolerance.



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**Date: 8 July 2022 (Friday)**

**Time: 16:00-17:00 (Hong Kong Standard Time GMT +8)**

**Venue: Online Talk via Zoom (Meeting ID: 942 8276 3334)**

**Speaker: Dr. Imre Fekete, Eötvös Loránd University**

**Host: Prof. Zhonghua Qiao, The Hong Kong Polytechnic University**

**Click to join:**

<https://polyu.zoom.us/j/94282763334?pwd=MmE5SExYM2xEZ3JxMC9CUGw3ck9lQT09>

**\*\*\* ALL ARE WELCOME \*\*\***

For enrolment, please send your name and email to [wai-yan.moon@polyu.edu.hk](mailto:wai-yan.moon@polyu.edu.hk) on or before 7 July 2022