



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

Colloquium

Low regularity Fourier integrators for some nonlinear dispersive equations

By

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Abstract

Substantial numerical research has been undertaken for solving the nonlinear Schrodinger equation, and many methods have been developed such as in finite difference methods, operator splitting, spectral methods, discontinuous Galerkin methods and exponential integrators. In recent years, more and more attention has been paid to the low regularity problem based on the practical needs. Exponential integrators have been shown effectively in dealing with low regularity problem.

In this talk, some Fourier integrators are proposed for solving the nonlinear Schrodinger equation. The designation of the scheme is based on the exponential-type integration and the Phase-Space analysis of the nonlinear dynamics. The schemes are explicit and can be implemented using the fast Fourier transform. By the rigorous analysis, the new schemes provide the first-order or second-order accuracy in Sobolev spaces for rough data, and reduce the regularity requirement of existing methods so far for optimal convergence. Moreover, the conservation laws of the numerical solutions are considered.

Date : 18 November, 2020 (Wednesday)

Time : 15:00 -16:00 (Hong Kong Standard Time GMT +8)

Venue : Online Talk via Zoom(Meeting ID: 961 0551 2487)

Speaker: Prof. Wu Yifei ,Center for Applied Mathematics, Tianjin University

Host: Dr. Li Buyang, The Hong Kong Polytechnic University

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