

METU Mathematics General Seminar

Integrable PDEs with nonlocalities

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Abstract

This talk will first introduce integrable differential equations and the concept of solitons. The origin of Ablowitz–Musslimani-type nonlocal reductions and their relationship with classical integrable systems will then be considered. Using the nonlinear Schrödinger system (NLS) as an illustrative example, it will be shown how nonlocal reductions are obtained. Hirota’s bilinear method will subsequently be introduced, and its role in deriving soliton solutions of nonlocal integrable equations will be explained. Soliton solutions obtained for the NLS system and its nonlocal reductions, together with recent studies on shifted nonlocal reductions, will be presented. It will also be demonstrated that, for real shift parameters, shifted nonlocal equations can be transformed into their unshifted counterparts through suitable translations of the independent variables. Finally, possible directions for future research will be discussed.

Date: Thursday, 15 October 2026

Time: 15:40

Place: Gündüz İkedâ Seminar Room