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A Talk at the 2nd ISNMP Conference

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Regular Session:

Speaker: Ruoxia Yao (Shaanxi Normal University, PR China)

Title: *Novel existence conjectures and unified constraints for higher-order peakons/pseudo peakons in generalized J-K-CH equations*

Abstract: In this talk, we will focuse on investigating peakon and pseudo-peakon waves for the generalized higher-order Camassa-Holm (CH) equations, J-K-CH. By utilizing the weak solution of the generalized J-K-CH equations and leveraging properties of the signum function, generalized/distribution functions, we establish a theoretical framework to construct higher-order peakon and pseudo- peakon waves and give some conjectures related to the forms and properties of the higher-order peakon waves and pseudo-peakon waves. Then, analyzing the unified constraint conditions, we derive some results: for J-1-CH equation ($\forall J \geq 4$), a 5th-order pseudo-peakon; for J-2-CH equation ($\forall J \geq 6$), a 7th-order pseudo-peakon; for J-3-CH equation ($\forall J \geq 8$), a 9th-order pseudo- peakon; and for the generalized J-K-CH equation ($\forall J \geq 2(K+1)$), a $(2K+3)$th-order pseudo-peakon. Also, more higher-order pseudo-peakons are given by analyzing the continuity and the singularity conditions respectively.