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Zhaosheng Feng* (zhaosheng.feng@utrgv.edu), 1201 University Drive, Mcallen, TX 78539.

Approximate Solutions to the Korteweg-de Vries-Burgers Equation.

In this talk, we develop a connection between the Abel equation of the first kind, an ordinary differential equation that is cubic in the unknown function, and the Korteweg-de Vries-Burgers equation, a partial differential equation that describes the propagation of waves on liquid-filled elastic tubes. We convert the problem into an equivalent integral equation by using the Abel transformation with the initial condition. By virtue of the integral equation and the Banach Contraction Mapping Principle we derive the asymptotic expansion of bounded solutions in the Banach space, and use the asymptotic formula to construct approximate solutions to the Korteweg-de Vries-Burgers equation. (Received July 17, 2017)