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Evolution of Benjamin–Ono Solitons in the Presence of Weak Z-K Lateral Dispersion

The talk is about the effect of weak lateral dispersion of Z-K type on a Benjamin–Ono solitary wave. The asymptotic solution is based on an approximate variational solution for the solitary wave, which is then modulated in time through the use of conservation equations. The effect of the dispersive radiation shed as the solitary wave evolves is also included in the modulation equations. It is found that the weak lateral dispersion produces a strongly anisotropic, stable solitary wave which decays algebraically in the direction of propagation, as for the Benjamin–Ono solitary wave, and exponentially in the transverse direction. Also, it is found that the initial conditions with amplitude above a threshold evolve into solitary waves, while those with amplitude below the threshold evolve as lumps for a short time, then merge into radiation.