Focusing of the wave packets on currents

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The focusing of the transient wave groups on currents is studied analytically and numerically. Two linear models are analyzed. The first model is based on the kinematic equations of hyperbolic type for the wave amplitude and frequency. The second one is based on linear parabolic equation for the complex amplitude, which is parabolic. The wave current modifies the dispersion relation for water waves (Doppler effect), and has an influence on the wave speed and wave dispersion. Detailed calculations have been done for both directions of the current-wave propagation.