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Wave-interference Effects in the Presence of a Shear Current YAN LI, SIMEN ELLINGSEN, Norwegian University of Science and Technology, FRANCIS NOBLESSE, Shanghai Jiao Tong University — Wave-interference effects, based on a 2-point wavemaker model of monohull ships, are analysed when a shear current of uniform vorticity is present. Indeed, wave interferences in the presence of a shear current, similar to the cases in finite water depth, are considerably more complicated than in deep water without vorticity. The effects of a shear current on far-field waves that are formed by 2-point wavemaker models greatly depend on the shear Froude number VS/g, where V is the speed of the ship, S is the uniform vorticity of the shear, g is the gravitational acceleration, as well as the angle between the ship's motion direction and the shear current. Various circumstances, under which ray angles of the highest waves that are associated with constructive interferences between waves are much narrower than the wake angles of the cusps or the asymptotes of wave patterns formed by Kelvin's classical 1-point wavemaker, are shown. In particular, cusp shear Froude numbers Frscusp where ray angles of the highest waves are equal to the cusp angles are determined. As for shear Froude numbers VS/g that are larger than Frscusp, the apparent angles where highest waves are found are significantly smaller than the cusp/asymptote angles. Furthermore, the asymmetry due to the presence of a shear current results in remarkable differences between the cases where a ship moves upstream or downstream.

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