

Abstract Submitted  
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**Direct Numerical Simulation of Wind Wave Growth<sup>1</sup>** JIARONG

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The growth of wind wave is still an open question as current models often diverge in both the mechanism postulated and the growth rate predicted. There have been an increasing number of numerical studies on this subject, with the development of various numerical methods and increase in computational power. The difficulty, however, arises from three aspects: the modeling of the turbulent air boundary layer; the response of water to the wind forcing; and the coupling between the two. Separate numerical studies have been done on the first two but are insufficient in revealing the whole picture of wind wave interaction. Using the open source solver Basilisk, which solves the full two-phase air water incompressible Navier-Stokes equations with adaptive grids, we perform fully coupled wind wave simulation to study a range of parameters that factor into the growth model, including the friction velocity of air, initial wave amplitude, surface tension and viscosity, and to improve the current models of wind wave growth.

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