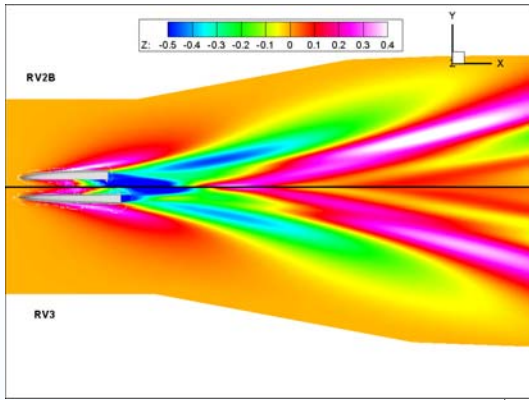
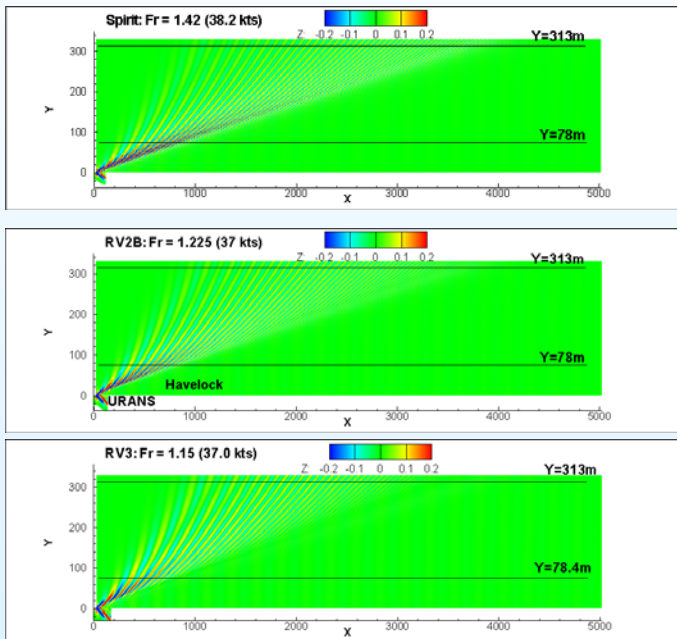
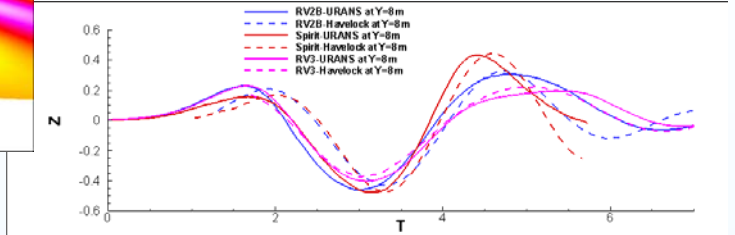


# Results for New Research Vessel



CFD modeling of wake elevation patterns (plan view and profile) in close proximity to the vessel show a reduction in wake height between *RV2B* (top plan view) and *RV3* (bottom plan view). The CFD optimization process indicated that a 30 m hull form achieved the best compromise between wave making and total resistance. The final hull form *RV3* is approximately 3 m longer than the initial design, *RV2B*.



Although the new hull design is almost 8 m (26 feet) longer and considerably heavier than the demonstration vessel *Spirit*, the new vessel is anticipated to have considerably improved wakewash characteristics in terms of both wave height and energy relative to *Spirit* and the other variants that were tested. The predicted wake height and energy at approximately 300 m from sailing line produced by *Spirit*, *RV2B*, and the new research vessel design (*RV3*) based on CFD modeling is shown in the figures to the left. The spatial distributions of the farfield predictions of wake height emphasize the improved wakewash characteristics of *RV3* (bottom) and the potential reduction of wake energy at the shoreline.

## Wake Criterion

Previously, WSF developed a wake criterion to keep the largest wave height in a wake to less than or equal to 0.28 m for the selection of POFF vessels in the 1990's. A more comprehensive set of criteria for wakewash is being developed to better reflect the relationship between wakes from high speed vessels and shorelines in the study area. The new criteria include full spectral wake characteristics, number of trips per day, speed restrictions for extreme water levels, and recommended sailing lines.

## Wake Height and Energy

The predicted wake height and energy at approximately 300 m from sailing line produced by the new design (*RV3*) based on CFD modeling is shown in comparison with corresponding measured data for *Spirit*, the new wakewash criterion, and an earlier design variant (*RV2B*), as well as *Chinook* and the WSF wake criterion.

