Journal of Visualization, Vol. 9, No. 4 (2006) 355

Slamming Simulation

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Received 16 November 2006

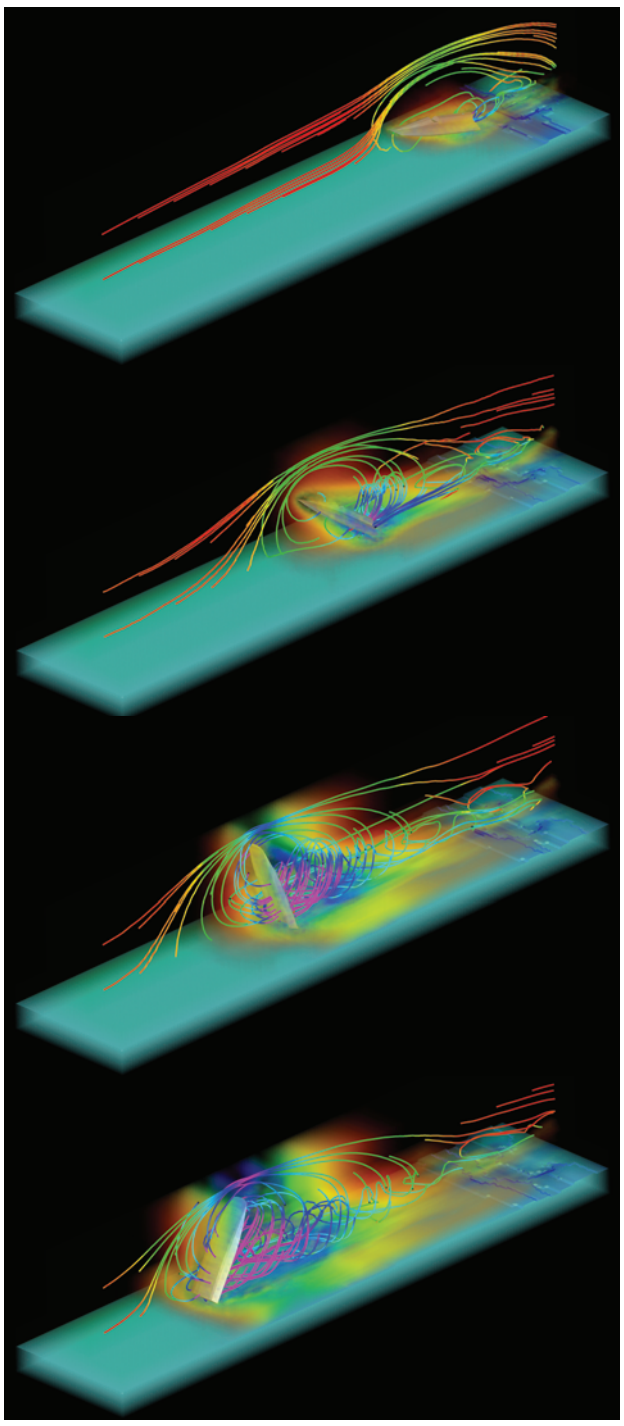

Fig. 1.

These figures show a high speed impact of a boat and wave simulated. The type of the simulation problem is usually solved by Lagrange-Euler approach. The current problem was solved by Sergey A. Sergievskiy from Moscow office of MSC.Software Corporation and visualized using the ScientificVR® package of GDT Software Group, which allows arranging differing visualization techniques simultaneously, namely the semitransparent voxel technique, the semitransparent voxel technique in iso-surface realization and streamlines. Here the semitransparent voxel technique and voxel technique in iso-surface realization present a parameter distribution, such as velocity module distribution of air flowing around the boat and water. The streamlines present vector values of velocity. The voxels, iso-surfaces and streamlines are colored according to a velocity module. The red color is for low module values, and the violet color is for the high ones.

Figure 1(a) shows the moment, when the boat has just passed through the wave. One can see clearly dark blue waves appeared in the place of the passing. The “water-air” interface is presented by light blue voxels in iso-surface realization. Figure 1(b) shows the moment of the first turbulence formation behind the boat, which is caused by a large attack angle of the boat. The turbulence formation is presented by colored voxel graphics and streamlines. Figure 1(c) shows the moment of peak turbulences around the boat, which drives with the attack angle close by the maximum. Figure 1(d) shows the moment of the boat overturning.