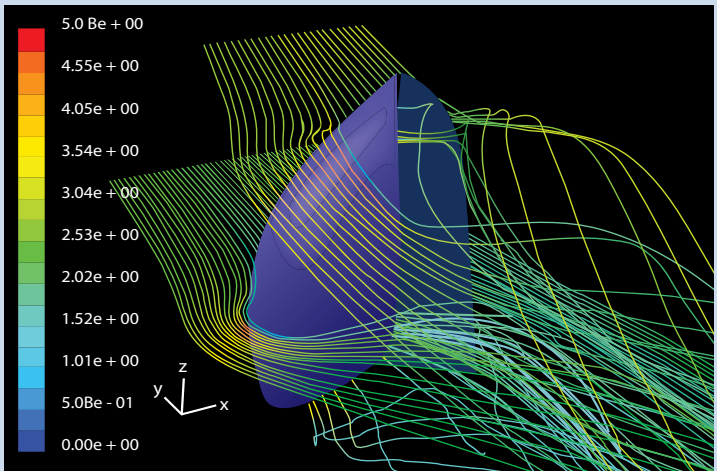

This VWT screen grab illustrates windflow at two planes on an America's Cup asymmetrical spinnaker.

The Virtual Wind Tunnel

Using computers to recreate airflow when sailing downwind has long been problematic. North Sails and Dartmouth College's Thayer School of Engineering developed a computer program called Virtual Wind Tunnel that has been used to model spinnakers for the America's Cup. The VWT uses RANS (Reynolds Averaging Navier-Stokes) computational fluid dynamics (CFD) code to track the flow of air particles over a sail while integrating boatspeed, heel, leeway, true wind angle, and true wind speed. North's finite element analysis program then uses the pressure distribution from the CFD code to compute the flying shape of a given sail or sail plan. The virtual snapshot accelerates sail design, but it can't replace wind-tunnel work and full-scale testing. The best concepts are still built and tested on the water with two-boat testing.