Mr. John Horgan  
Scientific American  
415 Madison Avenue  
New York, NY 10017

Dear Mr. Horgan:

Enclosed are two photographs of flow solutions about a generic hypersonic lifting body. These flow solutions were obtained using the thin-layer Navier Stokes equations on about 200,000 grid points.

Figure 1 shows line contours of constant temperature for a Mach 19, zero-degree angle-of-attack solution. The Reynolds number is 30,000/in. The color of the contour corresponds to a non-dimensional temperature as indicated by the color bar to the right of the picture. The body is colored grey to enhance the ability of the engineer to see what is happening in the flowfield.

Figure 2 shows the same temperature map with solid color contours and a different color bar. Note that the surface is green, indicating a constant wall temperature, and the surface geometry definition is shown in white on top of the green. The small photo at the top left is a forward-looking view of the vehicle. The calculation is being compared to wind tunnel data on the same vehicle to determine how well the computer code represents reality. These types of solutions take about 10 hours of computer time to complete on a state-of-the-art supercomputer.

Sincerely,

H. Lee Beach, Jr.  
Deputy Director  
for Aeronautics

2 Enclosures

cc: Mr. Timothy Beardsley  
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cc:  
101/CRMS  
116/OD/AERO  
195/HSAD  
156/CMB  
156/P. F. Richardson
HYPERSONIC LIFTING BODY

AOA = 0
M = 19.2
Re = 30000/in