1116-35-1995 **Thomas C. Sideris*** (sideris@math.ucsb.edu), Department of Mathematics, University of California, Santa Barbara, CA 93106. *Global behavior of the free boundary of an ideal fluid surrounded by vacuum in the class of affine deformations.*

We consider solutions of the initial value problem for the three-dimensional compressible and incompressible Euler equations with physical vacuum boundary condition. Local well-posedness has been established in a series of papers by various authors. We shall discuss the global existence and asymptotic behavior of solutions in the class of affine deformations. Here the free boundary of the fluid domain is ellipsoidal, and its diameter grows at a rate proportional to time. After rescaling, a wide variety ellipsoidal configurations can be realized, including degenerate cases. (Received September 21, 2015)