

SOME STEADY AXISYMMETRIC VORTEX FLOWS PAST A SPHERE

ALAN R. ELCRAT, BENGT FORNBERG AND KENNETH G. MILLER

ABSTRACT. Steady axisymmetric vortex flows past a sphere are obtained numerically as solutions of a partial differential equation for the stream function. The solutions found include vortex rings, attached vortices and infinite vortex tubes. One family of attached vortices has led to the discovery of a generalization of Hill's spherical vortex in which a spherical annular vortex surrounds the spherical obstacle. Three other families of attached vortices are also described. Computations are given showing families of vortex rings with the same circulation connected to each attached vortex, analogous to earlier work of Norbury for vortex rings translating in space.