

**EXISTENCE OF UNBOUNDED SOLUTIONS TO A ONE DIMENSIONAL
ISENTROPIC PERIODIC FLOW OF A COMPRESSIBLE VISCOUS FLUID
WITH SELF-GRAVITATION**

MASAHIRO SAWADA AND YOSHITAKA YAMAMOTO

Received December 11, 2015 ; revised February 2, 2016

ABSTRACT. We consider a one dimensional isentropic periodic flow of a compressible viscous fluid driven by a self-gravitation of the fluid. We show the existence of an unbounded solution of a system describing the flow. A sufficient condition for the unboundedness is given in terms of the initial values of an energy form.

Key words and phrases. one dimensional isentropic flow, compressible viscous fluid, self-gravitation, unbounded solutions.