1052-76-79   **John D. Carter*** (`carterj1@seattleu.edu`), 901 12th Ave, Seattle University, Mathematics Department, Seattle, WA 98122, and **Rodrigo Cienfuegos** (`racienfu@ing.puc.cl`), Depto. Ingenieria Hidraulica y Ambiental, Pontificia Universidad Catolica de Chile, Av. Vincuna Mackenna 4860-Macul, Santiago, Chile. *Periodic solutions of the Serre equations.*

The Serre equations are a pair of strongly nonlinear, weakly dispersive, Boussinesq-type partial differential equations. They model the evolution of the surface elevation and the depth-averaged horizontal velocity of an inviscid, irrotational, incompressible fluid on a horizontal bottom. We present a three-parameter family of periodic solutions of the Serre equations and examine their linear stability. We establish that waves with sufficiently small amplitude/steepness are stable while waves with sufficiently large amplitude/steepness are unstable. (Received August 20, 2009)