

**Krichever, I. M.**

**A periodic problem for the Kadomtsev-Petviashvili equation.** (English. Russian original)

Zbl 0699.35213

Sov. Math., Dokl. 37, No. 1, 157-161 (1988); translation from Dokl. Akad. Nauk SSSR 298, No. 4, 802-807 (1988).

The author discusses the difference between two variants ( $\sigma^2 = 1$  or  $\sigma^2 = -1$ ) of the equation

$$(3/4)\sigma^2 u_{yy} + (u_t - (3/2)uu_x + u_{xxx})_x = 0$$

as the explicit solution of the periodic Cauchy problem is concerned. While the case  $\sigma^2 = -1$  is proved to be formally non-integrable, the Cauchy problem for the case  $\sigma^1 = 1$  can be locally resolved in the following sense: for any smooth, real, periodic and finite-zone solution  $u_0(x, y, t)$  there exists a positive constant  $\epsilon$  such that for any smooth, real, periodic function  $v(x, y)$  with  $|u_0(x, y, 0) - v(x, y)| < \epsilon$  a unique solution  $u(x, y, t)$  exists satisfying the initial condition  $u(x, y, 0) = v(x, y)$ .

Reviewer: J.Chrastina

**MSC:**

**35Q99** Partial differential equations of mathematical physics and other areas of application

**35B10** Periodic solutions to PDEs

Cited in **2** Documents

**Keywords:**

formal integrability; Cauchy problem; finite-zone solution