ERRATA TO “LOW REGULARITY SOLUTIONS FOR THE KADOMTSEV–PETVIASHVILI I EQUATION”, GAFA, GEOM. FUNCT. ANAL. 13 (2003), 737–794.

JAMES COLLIANDER, CARLOS E. KENIG
 AND GIGLIOLA STAFFILANI

In the paper [CKS] we considered the KP-I initial value problem

$$\begin{cases} \partial_t u + \partial_x^3 u - \partial_x^{-1} \partial_y^2 u + \partial_x(u^2/2) = 0, \\ u(0) = \phi, \end{cases} \quad (0.1)$$

on $\mathbb{R}_{x,y}^2 \times \mathbb{R}_t$, with initial data ϕ in the space $E \cap P$, where $E = \{f : f \in L^2, \partial_x f \in L^2, \partial_y \partial_x^{-1} f \in L^2\}$ and $P = \{f : yf \in L^2\}$. The main result in [CKS], ([CKS, Th. 1]) is a weak form of local in time well-posedness for data which is small in $E \cap P$. Unfortunately, A. Ionescu discovered a counterexample to the main estimate used in [CKS] to establish Theorem 1. The example exhibits a logarithmic divergence in the estimate, which shows that the proof of Theorem 1 in [CKS] is incorrect. The same applies to Theorem 2 in [CKS], which claims the corresponding result at an ϵ smaller regularity level. The authors are very grateful to A. Ionescu for pointing out this mistake.

In the paper [CIKS], joint with A. Ionescu, we describe the counterexample in detail ([CIKS, §1.1]) and succeed in obtaining a strengthening of Theorem 1 in [CKS], namely the strong form of local in time well-posedness for small data in $E \cap P$ ([CIKS, Th. 1.1]). The logarithmic divergence is avoided in [CIKS] by introducing new resolution spaces, inspired by those used by Ionescu–Kenig ([IK1,2,3]) in works on the Benjamin–Ono and the Schrödinger map problems. It seems likely (but not particularly interesting at this point in time) that the methods developed in [CIKS] would also provide a correct (and similarly strengthened) version of Theorem 2 in [CKS].

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JAMES COLLIANDER, Dept. of Math., University of Toronto, 100 St George St,
Toronto, Ontario M5S 3G3, Canada colliand@math.toronto.edu

CARLOS E. KENIG, Dept. of Math., University of Chicago, 5734 University Avenue,
Chicago, IL 60637-1514, USA cek@math.uchicago.edu

GIGLIOLA STAFFILANI, Dept. of Math., Massachusetts Institute of Technology, 77
Massachusetts Ave., Cambridge, MA 02139-4307, USA gigliola@math.mit.edu

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