



**Erratum: “Eulerian simulations of collisional effects on electrostatic plasma waves”
[Phys. Plasmas 20, 092111 (2013)]**

Oreste Pezzi, Francesco Valentini, Denise Perrone, and Pierluigi Veltri

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Erratum: “Eulerian simulations of collisional effects on electrostatic plasma waves” [Phys. Plasmas 20, 092111 (2013)]

Oreste Pezzi, Francesco Valentini, Denise Perrone, and Pierluigi Veltri
 Dipartimento di Fisica and CNISM, Università della Calabria, 87036 Rende (CS), Italy

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Due to a technical error in the implementation of a numerical routine, in the original article¹ the effects of collisions described by the Dougherty (DG) operator have been underestimated. It is worth noting that this technical error cannot be pointed out in the linear regime of wave propagation described in Fig. 7 of Ref. 1, since it does not produce any significant change in the collisional damping of the wave amplitude. However, once this technical problem has been fixed, when performing simulations of plasma echoes in presence of collisions, collisional damping of Bernstein-Greene-Kruskal (BGK) modes, and filamentation problem in collisional plasmas, an enhanced collisionality has been recovered for the DG operator. This does not change qualitatively the physical features of the DG operator discussed in Ref. 1; nevertheless, the use of the correct numerical routine produces quantitative variations in two figures and in the estimation of the parameters in a fitting procedure described in the original article.¹ Here, we present the new version of Figs. 8–9 in Ref. 1 and the new results for the fitting procedure in Sec. V in Ref. 1, obtained by repeating the numerical simulations of Ref. 1 with the same numerical parameters but with the corrected version of the DG numerical routine, together with a short discussion and some considerations.

Figure 1, concerning a group of simulations of plasma wave echoes, represents the ratio A/A_{NC} between the echo amplitude in the presence of collisions and in the collisionless case, as a function of the collisional frequency ν_0 . Here, the solid line represents the theoretical curve by O’Neil in Eq. (8) of Ref. 1, while the red stars indicate the results of

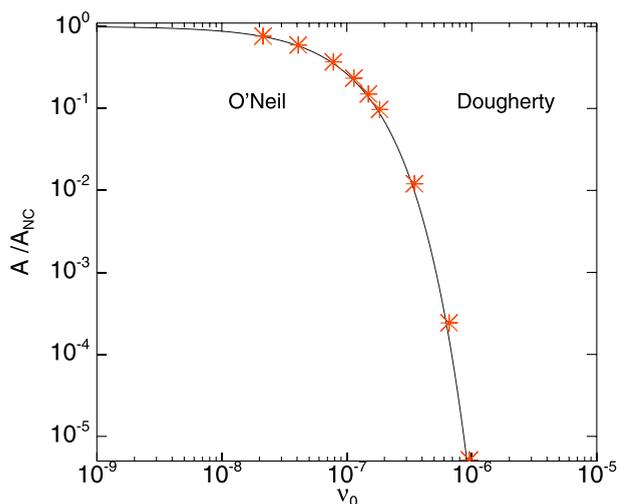


FIG. 1. The new corrected version of Fig. 8 in Ref. 1.

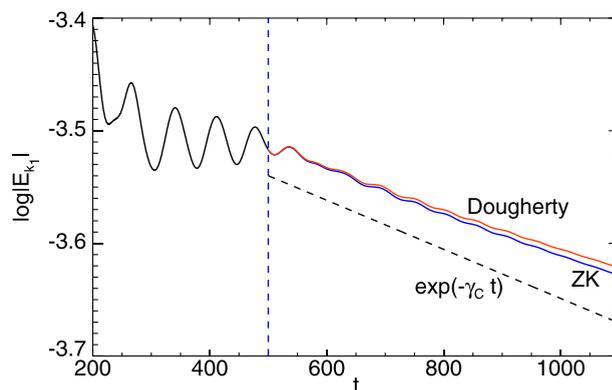


FIG. 2. The new corrected version of Fig. 9 in Ref. 1.

the new numerical experiments. When comparing this figure to Fig. 8 in Ref. 1, one easily realizes that the effects of the DG operator have been quite significantly underestimated in the original article.¹ From this new plot, it can be evinced that, for the case of small amplitude wave echoes, the effects of the DG operator are strictly comparable to those of the O’Neil operator in Eq. (4) of Ref. 1.

Figure 2 displays the time evolution of the electric field amplitude of a BGK structure in presence of collisions modeled through the DG operator (red-solid line) and the Zakharov-Karpman (ZK) one (black-solid line); the form of the ZK operator is reported in Eq. (3) of Ref. 1. It appears quite clear from this figure that the collisional effects of DG and ZK operators are similar, even though the DG operator displays a somewhat reduced collisionality in the large time limit. This effect had been already pointed out and discussed in Ref. 1, where, however, the technical problem in the DG numerical routine produced an underestimated DG collisionality, as it can be seen when looking at Fig. 9 in Ref. 1.

To conclude, we point out that, when performing new numerical simulations of the filamentation problem, the parameters of the fitting procedure in Sec. V of Ref. 1, concerning the expression of the filamentation scale δv as a function of the plasma parameter g and the wavenumber k_1 , are changed as $\delta v = 1.4542g^{0.55}/k_1$. It is worth to emphasize that Fig. 10 in the original article¹ is not changed when the correct version of the DG numerical routine is used, this confirming that, as already shown in Ref. 1, collisionality prevents the generation of small filamentation velocity scales in a Eulerian simulation.

¹O. Pezzi, F. Valentini, D. Perrone, and P. Veltri, *Phys. Plasmas* 20, 092111 (2013).