Erratum: Continuum analysis of an avalanche model for solar flares [Phys. Rev. E 66, 056111 (2002)]

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The calculation of the falloff energy and total dissipating energy frequency spectra should be modified because for a fourth-order hyperdiffusion equation the energy dissipation is not proportional to the square of the flux (as in the case of a second-order diffusion equation). According to Eq. (11), the rate of local energy dissipation is

$$\mathcal{D} = \frac{\partial}{\partial t}\left(\frac{A^2}{2}\right) = -\nu A \frac{\partial^4 A}{\partial x^4}, \tag{34}$$

where only the dominant term (for $\epsilon < 0$) is included. Using the derived scaling exponents, it is found that $\mathcal{D} \sim x^{c_3} \equiv x^0$. Equations (35)–(38) have the same form as before, but with c_3 and $2c_3$ now replaced by 0, and J_A^2 by $\mathcal{D}$. The previous Eq. (39), which has a typo and should be $\mathcal{E}(\omega) = c_{\mathcal{E}} \omega^{-[1+2(c_3+1)/c_1]}$, is now

$$\mathcal{E}(\omega) = c_{\mathcal{E}} \omega^{-(1+2/c_1)}. \tag{39}$$

The power-law indices for the falloff energy and the total dissipation energy are then -1 and $-13/9$, respectively. These values are slightly steeper than those found in Figs. 7 and 8, which are calculated from the time series (4×10^6), that is much longer than the avalanche duration period ($\sim 10^3$ steps), with data binning in the spectral space. The new indices agree well with the frequency spectra for time series spanning one to several continuous avalanche events.

