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Erratum

Resonantly damped oscillations of longitudinally stratified coronal loops

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The following corrections should be introduced in the paper:

1. In Sect. 6.1, the third paragraph up to Eq. (71) has to be: "Now we are in a position to prove the a priori assumption made in Sect. 3 that $\Lambda_1^2 > 0$. We will prove that the fundamental mode of the magnetic tube oscillations is non-leaky. When the equilibrium is symmetric with respect to the apex point, i.e. $\rho_i(-z) = \rho_i(z)$, the first overtone is also non-leaky. Let us consider the fundamental mode of tube oscillations and take $\omega_r = \omega_{01}$ in Eq. (24). Since ω_{01}^2 is an eigenvalue of the Sturm-Liouville problem (12) with the corresponding eigenfunction qW_1 when $r = r_c$, we can use Eq. (12) to express ω_{01}^2 in terms of W_1,"
2. The quantities W_1 and ω_{01} have to be substituted for W_n and ω_{0n} respectively in Eqs. (71)–(73) and in the text in between these equations.
3. The text starting after Eq. (73) and up to the end of Sect. 6.1 has to be: "In accordance with the general theory of the Sturm-Liouville problem both W_1 and G_1 have simple zeros at $z = \pm L$ and do not have zeros in the interval $(-L, L)$. This implies that the function G_1/W_1 is regular in $[-L, L]$.

Integrating Eq. (73) from $-L$ to L and using integration by parts we obtain

$$\Lambda_1^2 \int_{-L}^{L} G_1^2 = \left(1 - \frac{\chi}{f_c}\right) \int_{-L}^{L} \left(\frac{dG_1}{dz}\right)^2 dz + \frac{\chi}{f_c} \int_{-L}^{L} W_1 \left[\frac{d}{dz}\left(\frac{G_1}{W_1}\right)\right]^2 dz. \quad (74)$$

Since $\chi < f_c$, this equation implies that $\Lambda_1^2 > 0$, i.e. the fundamental mode is non-leaky.

When the equilibrium is symmetric with respect to the apex point, $\rho_i(-z) = \rho_i(z)$, $W_n(z)$ is even for odd n, and the same is true for $G_n(z)$. This implies that, for the first overtone, the expansion (25) contains only terms with even numbers. Therefore the first overtone is non-leaky if $\Lambda_2^2 > 0$. In the same way as in the case of the fundamental mode we obtain Eq. (73) however with W_2, G_2 and Λ_2 substituted for W_1, G_1 and Λ_1. Function $W_2(z)$ has a simple zero at $z = 0$. Since G_2 is an odd function, $G_2(0) = 0$ and G_2/W_2 is a regular function in $[-L, L]$. Hence, the obtained equation can be integrated form $-L$ to L. As a result we obtain Eq. (74) however with W_2, G_2 and Λ_2 substituted for W_1, G_1 and Λ_1. This equation shows that $\Lambda_2^2 > 0$, so that the first overtone is non-leaky.

As for higher overtones as well as the first overtone when the equilibrium is non-symmetric, it seems that they can be leaky even when $\rho_i > \rho_e$ for any z. However this problem needs further investigation."