Erratum: "The Band Gap Formation in Rotors With Longitudinal Periodicity and Quasi-Periodicity" [ASME J. Eng. Gas Turbines Power, 2022, 144(5), p. 051003; DOI: 10.1115/1.4053193]

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Equation (10) gives

$$\sum_{j=1}^{n} f(x_j) \approx \frac{1}{\Delta x}\int_0^L f(x)\,dx$$

where

$$f(x_j) = \frac{m_j}{\rho AL}\phi_i(x_j)\phi_k(x_j)$$

Considering that all disks have the same mass m_D, then

$$f(x_j) = \frac{m_D}{\rho AL}\phi_i(x_j)\phi_k(x_j)$$

Hence, from Eq. (10)

$$\sum_{j=1}^{N_D} \frac{m_D}{\rho AL}\phi_i(x_j)\phi_k(x_j) \approx \frac{1}{\Delta x}\int_0^L \frac{m_D}{\rho AL}\phi_i(x)\phi_k(x)\,dx = \frac{\hat{m}}{\Delta x}L\delta_{ik} = \hat{m}(N_D+1)\delta_{ik} = \mu\delta_{ik} \quad (11)$$

where $\hat{m} = m_D/\rho AL$ and $\mu = \hat{m}(N_D+1)$, which we can call the specific disk mass.

Similarly, if we consider that all disks have the same inertia J_D, then

$$\sum_{j=1}^{N_D} \frac{J_D}{\rho AL}\phi_i(x_j)\frac{d^2\phi_k(x_j)}{dx^2} \approx \frac{1}{\Delta x}\int_0^L \frac{J_D}{\rho AL}\phi_i(x)\frac{d^2\phi_k(x)}{dx^2}\,dx \quad (12)$$

Therefore, considering Eqs. (13) and (14)

$$\sum_{j=1}^{N_D} \frac{J_D}{\rho AL}\phi_i(x_j)\phi_k(x_j) \approx \frac{1}{\Delta x}\int_0^L -\frac{J_D}{\rho AL}\left(\frac{k\pi}{L}\right)^2\phi_i(x)\phi_k(x)\,dx = -\hat{J}(N_D+1)\left(\frac{k\pi}{L}\right)^2\delta_{ik} = \lambda\left(\frac{k\pi}{L}\right)^2\delta_{ik} \quad (15)$$

where $\hat{J} = J_D/\rho AL$ and $\lambda = \hat{J}(N_D+1)$, which we can call the specific disk inertia.

The results shown in Figs. 15–17 were obtained using the present formulation of μ and λ.