A nonlocal connection between certain linear and nonlinear ordinary differential equations/oscillators

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Erratum

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The third derivatives in this paper were inadvertently replaced with second derivatives during processing.

The following six equations are corrected:

$$\dddot{U} + c_1\ddot{U} + c_2\dot{U} + c_3U = 0 \tag{35}$$

$$\dddot{x} + \left[3(n-1)\frac{\dot{x}}{x} + d_1(t,x)\right]\ddot{x} + (n-1)(n-2)\frac{\dot{x}^3}{x^2} + d_2(t,x)\dot{x}^2 + d_3(t,x)\dot{x} + \frac{\beta^3}{n}x^{3m+1} + d_4(t)x^{2m+1} + d_5(t)x^{m+1} + d_6(t)x = 0 \tag{36}$$

$$\dddot{x} + 4kx\ddot{x} + 3k\dot{x}^2 + 6k^2x^2\dot{x} + k^3x^4 = 0 \tag{43}$$

$$\dddot{x} + (c_1 + 4kx)\ddot{x} + 3k\dot{x}^2 + 3k(c_1 + 2kx)x\dot{x} + (c_1 + kx)k^2x^3 = 0 \tag{46}$$

$$\dddot{x} + 4kx\ddot{x} + 3k\dot{x}^2 + 6k^2x^2\dot{x} + k^3x^4 + c_3x = 0 \tag{49}$$

$$\dddot{x} + (c_1 + 4kx)\ddot{x} + 3k\dot{x}^2 + (c_2 + 3kc_1 + 6k^2x)x\dot{x} + (c_1 + kx)k^2x^3 + c_2kx^2 + c_3x = 0 \tag{52}$$

In section 3.2 the first line should read 'In this case, the linear equation (35) becomes $\dddot{U} + c_1\ddot{U} = 0$...'.

In section 3.3 the first sentence should read 'In this case, the linear ODE (35) assumes the form $\dddot{U} + c_3U = 0$ and the nonlocal transformation (12) transforms this equation, $\dddot{U} + c_3U = 0$...'.

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