

Abstract Submitted
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Force at the surface of a swirl in a fluid obeying the 3D-wave equation: closed form equations from our novel nonharmonic solutions to the wave equation in spherical coordinates. HECTOR MUNERA, International Centre for Physics (CIF) — This writer discovered in the 1990s new nonharmonic closed solutions for the three-dimensional homogeneous classical wave equation (3D-HCWE) in spherical coordinates [1-3]. Here we report for the first time the force at the surface of a swirl formed in a classical fluid described by the 3D-HCWE. Force is obtained in closed form, and calculation does not require time consuming numerical methods. [1] Munera H A, Buritica D, Guzman O and Vallejo J I (1995) “Non-conventional solutions for the travelling wave equation” (in Spanish) *Revista Colombiana de Fisica (Colombian Journal of Physics)* **27** (1) 215-218. [2] Munera H A and Guzman O (1997) “New explicit nonperiodic solutions of the homogeneous wave equation” *Found. Phys. Lett.* **10** (1) 31-41. [3] Munera H A (2000) “New closed solutions in spherical coordinates for the three dimensional homogeneous wave equations” (in Spanish) *Momento* **20** 1-30.

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