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**Resonance of the geotrophic mode in a torus. (Étude de la résonance du mode géostrophique dans un tore.)** (French. Abridged English version) [Zbl 0981.76102](#)

*C. R. Acad. Sci., Paris, Sér. II, Fasc. b, Méc. Phys. Astron.* 327, No. 14, 1391-1396 (1999).

Summary: We investigate the oscillations of air contained in a pneumatic tyre; we assume that the tyre is a torus with generating circle of radius  $R$ , while a characteristic size of the area of contact with ground is  $a$ . We show that when  $\Omega R/c_0 \ll 1$  and  $a/R \ll 1$  (here  $\Omega$  is the constant angular velocity, and  $c_0$  is sound speed), the air motion in the torus can be considered as inertial oscillations excited by a perturbation on the torus' surface. This excitation makes one of the inertial oscillation modes resonant with the geostrophic mode, which increases proportionally to time when  $t \rightarrow \infty$ .

**MSC:**

[76U05](#) General theory of rotating fluids

Cited in **2** Documents

**Keywords:**

[air oscillations](#); [resonance](#); [pneumatic tyre](#); [torus](#); [inertial oscillations](#); [perturbation](#); [geostrophic mode](#)

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