A REALISTIC INTERACTION-FREE RESONATOR

Mladen Pavičić

AG Nichtklassische Strahlung, Berlin, Germany; pavicic@w421zrz.physik.tu-berlin.de;
Atominstitute of the Austrian Universities, Wien, Austria; pavicic@ati.ac.at;
University of Zagreb, Zagreb, Croatia; mpavicic@faust.irb.hr; Fax: +385-1-4828050

In our previous papers we designed a highly efficient interaction-free resonator [1, 2, 3] and considered its possible application to foundational experiments such as interaction-free interference erasure [4]. In this talk we present calculations for a realistic resonator which can interaction-free detect gray objects and objects being inserted within a round-trip time. The device consists of Pellin–Broca prisms which are designed so that their entrance and exit faces are at Brewster's angles thus minimizing reflection losses at these faces. The entrance prism is coupled to the adjacent loop prism by the frustrated total reflection. Our main result is that the time evolution of the interference in the resonator imposes restrictions on the experiment which however can be overcome by detecting two outputs. We present a computer animation of building up the resonator states in time, taking all possible losses into account.

References

[1] H. Paul and M. Pavičić, *Int. J. Theor. Phys.* **35**, 2085–2091 (1996).

[2] H. Paul and M. Pavičić, *J. Opt. Soc. Am.* **B 14**, 1273–1277 (1997).

[3] H. Paul and M. Pavičić, *Found. Phys.* **28**, (6) (June, 1998).

[4] M. Pavičić, *Phys. Lett.* **A 223**, 241-245 (1996).