

Tubular Image States and Current Injection in Nanotubes

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We want to present a new type of tubular image states (TIS) that can be formed around linear conductors and dielectrics, and in particular around metallic carbon nanotubes [1]. We especially plan to discuss new TIS configurations with several nanotubes and several electrons. These extraordinary Rydberg-like molecular states have a very large extent, well beyond the tubular skeleton, and possess peculiar physical properties. We will also briefly demonstrate the theory of electric current injection in nanotubes by optical [2,3] and frictional means [4].

[1] B. E. Granger, P. Kral, H. R. Sadeghpour and M. Shapiro, PRL 89, 135506 (2002).

[2] P. Kral and D. Tomanek, PRL 82, 5373 (1999).

[3] P. Kral, E. J. Mele and D. Tomanek, PRL 85, 1512 (2000).

[4] P. Kral and M. Shapiro, PRL 86, 131 (2001).