

1038-46-118

**Dimitri Shlyakhtenko\*** ([shlyakht@math.ucla.edu](mailto:shlyakht@math.ucla.edu)), Department of Mathematics, UCLA, Los Angeles, CA 90095. *Some applications of free stochastic calculus: absence of Cartan subalgebras in  $q$ -deformed free group factors.*

We prove that the Bozejko-Speicher  $q$ -deformed free group factors on  $n$  generators have microstates free entropy  $> 1$  for  $q$  in an interval of the form  $[0, f(n)]$ , where  $f(n) > 0$ . Our proof involves obtaining an Otto-Villani type estimate on the Biane-Voiculescu-Wasserstein distance for free diffusion starting at the non-commutative laws of  $q$ -semicircular variables, and then using such estimates to prove the lower bound on free entropy dimension. A similar computation gives a lower bound on the microstates free entropy dimension of a class of discrete groups, showing that for that class, microstates free entropy dimension, non-microstates free entropy dimension, and a combination of the first two  $L^2$  Betti numbers of the group are all the same. (Received February 04, 2008)