

1116-05-324

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The 25-year old *LCGD Conjecture* is that the genus distribution of every graph is log-concave. We present a new topological conjecture, called the *Local Log-Concavity Conjecture*. We also present a purely combinatorial conjecture, which we prove to be equivalent to the Local Log-Concavity Conjecture. We use the equivalence to prove the Local Log-Concavity Conjecture for graphs of maximum degree four. We then show how a formula of David Jackson could be used to prove log-concavity for the genus distributions of various partial rotation systems, with straight-forward application to proving the *local log-concavity* of additional classes of graphs. We close with an additional conjecture, whose proof, along with proof of the Local Log-Concavity Conjecture, would affirm the LCGD Conjecture. (Received September 03, 2015)