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Adam Giambrone* (giambro1@msu.edu). *Combinatorics of Link Diagrams and Volume*. Preliminary report.

One of the current aims of knot theory is to relate geometric invariants of links, quantum invariants of links, and combinatorial data associated to diagrams of links to each other. In this talk, we will begin with a study of the combinatorics of A-adequate link diagrams whose associated all-A state graphs satisfy a certain two-edge loop condition. From this investigation, we obtain a lower bound on the complexity of the all-A graph that can be expressed in terms of two diagrammatic quantities. By work of Futer, Kalfagianni, and Purcell, such links are usually hyperbolic and the complexity bound actually provides a lower bound on the volume of the link complement (a geometric invariant). This pairs nicely with work of Agol and D. Thurston to give two-sided bounds. Finally, by studying certain plat closures of braids, we are able to express the volume bounds in terms of a single diagrammatic quantity or, alternatively, in terms of a stable coefficient of the colored Jones polynomial (a quantum invariant). (Received September 14, 2013)