

**LOGARITHMIC CORRECTIONS TO SCALING FOR
THE 4 DIMENSIONAL WEAKLY SELF-AVOIDING
WALK: WATERMELON NETWORKS**

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We calculate the logarithmic correction to the decay of the critical two-point function for networks of p mutually-avoiding weakly self-avoiding walks joining two distant points on the 4-dimensional integer lattice. While similar results have been obtained previously for dimensions $d > 4$ by lace expansion, our proof is based on a rigorous renormalisation group analysis of a representation of the self-avoiding walk as a supersymmetric field theory. The talk is based on joint and ongoing work with Roland Bauerschmidt, David Brydges and my supervisor Gordon Slade.