

1135-94-855

**Nathan Albin, Jason Clemens** and **Nethali Fernando\***, Department of Mathematics, Kansas State University, Manhattan, KS 66506, and **Pietro Poggi-Corradini**. *A new proof that effective resistance is a metric on graphs.*

We explore the implications of blocking duality—pioneered by Fulkerson et al.—in the context of  $p$ -modulus on networks. Fulkerson’s blocking duality is an analogue on networks to the method of conjugate families of curves in the plane. The technique presented here leads to a general framework for studying families of objects on networks; each such family has a corresponding dual family whose  $p$ -modulus is essentially the reciprocal of the original family’s.

As an application, we give a modulus-based proof for the fact that effective resistance is a metric on graphs. This proof immediately generalizes to yield a family of graph metrics, depending on the parameter  $p$ , that continuously interpolates among the shortest-path metric, the effective resistance metric, and the mincut ultrametric. (Received September 15, 2017)