1053-30-365   **Erik Lundberg*** (`elundberg@mail.usf.edu`), 10014 N Pawnee Ave, Tampa, FL 33617. *Complex Lightning bolts: a barrier to analytic continuation of harmonic functions.*

We consider Dirichlet's problem in the plane with polynomial data on algebraic curves. How far outside the data curve can the solution be analytically continued? Making a complex change of variables, we see that if a special finite set called a "lightning bolt" can be located on the (complexified) data curve, then singularities have to occur. The lightning bolt is generated by following (complex) characteristics of Laplace's equation between consecutive vertices. We end with the question: "Can quaternions be used to generalize this technique to 4 dimensions?" (Received September 11, 2009)