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Minimal Harmonic Measure on Complementary Regions

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Abstract. For any two points a_1 and a_2 in an open disk Δ on the complex sphere $\overline{\mathbb{C}}$, let L be a curve separating a_1 from a_2 on $\overline{\mathbb{C}}$, which splits $\overline{\mathbb{C}}$ into two complementary regions $B_1 \ni a_1$ and $B_2 \ni a_2$. Let l be the part of this curve lying in $\bar{\Delta}$. In this note we study how small the average harmonic measure

$$\frac{1}{2}(\omega(a_1, l, B_1) + \omega(a_2, l, B_2))$$

can be. This question can be interpreted as a problem on the minimal average temperature at two points of a long cylinder composed of two media separated by a heating membrane each of which contains a reference point.

Keywords. Harmonic measure, module of a quadrilateral, complete elliptic integral.

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