1163-11-262   **Ryan Carpenter** and **Charles L Samuels*** (`charles.samuels@cnu.edu`). *Linear Programming and the Metric Mahler Measures.*

The metric Mahler measures, denoted by $m_t(\alpha)$ for each $t \in \mathbb{R}$ and $\alpha \in \overline{\mathbb{Q}}$, form a parametrized family of heights on $\overline{\mathbb{Q}}$ that are closely related to the classical Mahler measure. While these heights have a superficial relationship to Lehmer's problem, the more compelling reason to study them arises from a connection between the map $t \mapsto m_t(\alpha)$ and the arithmetic properties of α. Nevertheless, this map is notoriously difficult to study even when $\alpha \in \mathbb{Q}$. We apply techniques from linear programming and operations research to understand its behavior in certain special cases. Our work leads to a polynomial time algorithm for computing $m_t(\alpha)$ in those cases, a large improvement over the previously best known exponential time algorithm. This work is joint with Ryan Carpenter. (Received August 31, 2020)

1