

1018-52-143

**Sinai Robins\*** (srobins@temple.edu), Mathematics Department, Temple University, Philadelphia, PA 19122, and **Helaman Ferguson**. *Title: Integer linear programming using differentiable Dedekind sums from analytic number theory.* Preliminary report.

Abstract:

One of the most fundamental problems in integer linear programming is that of finding an integer point inside a given rational polytope. Here we develop a new tool to solve this problem. We first give a survey of the history of Dedekind sums, and show the current state of a recently developed theory of higher dimensional differentiable Dedekind sums.

We next use these differentiable Dedekind sums to locate integer points in rational polytopes. Some examples in low dimensions will be given. Moreover, no background in Dedekind sums is assumed at all, to maximize accessibility for the casual mathematical observer. This is joint work with Helaman Ferguson. (Received March 03, 2006)