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Philippe Gaborit* (gaborit@unilim.fr), XLIM-DMI, Université de Limoges, 123, av. Albert Thomas, 87000 Limoges, France. *A bound for certain s -extremal codes and lattices.*

The notion of shadow for Type I binary codes, introduced by Conway and Sloane allowed Rains to extend the well known bound for the minimum weight d of Type II codes to Type I codes. Besides this application of the shadow, Elkies studied the minimum weight s of the shadow of Type I codes (and also of Type I unimodular lattices) in itself. Building on Elkies work Bachoc and Gaborit proposed to study for Type I codes the parameters d and s simultaneously. They proved that $2d + s \leq \frac{n}{2} + 4$ (except for a special case) and they called s -extremal the codes for which equality holds.

In this talk after recalling basic properties of s -extremal binary self-dual codes (which have the properties to contain 1 and 2-designs), we introduce the notion of s -extremal lattices for unimodular Type I lattices and we give a bound on the existence of certain such s -extremal codes and lattices: an s -extremal codes with doubly even minimum distance d and length n must satisfy $n < 6d$ and an s -extremal lattice of dimension n and minimal even norm μ must satisfy $n < 12\mu$. We also review existing s -extremal codes and lattices. (Received August 29, 2006)