J. Martinet Last update: December 1st, 2010

UPDATE FOR SLIDES OF GRAS'S CONGRESS (COMBINATORICS AND LATTICES)

page 3.

A.-M. Bergé & J. Martinet has appeared :
Monatshefte Math. **140** (2003), 179–195.

J. Martinet & B. Venkov has appeared :
Algebra i Analiz (Saint-Petersburg) **16, 3** (2004), 99–142.

pages 8 and 9.

The classification is known for $n = 6$ and could be completed for $n = 7$, using
P. Elbaz-Vincent, H. Gangl, C. Soulé, *Perfect forms and the cohomology of modular groups*, submitted; preprint at arXiv:math/1001.0789v1.
Some numerical data are available on my homepage
http://www.math.u-bordeaux.fr/~martinet/ ,
"Catalogue of perfect lattices", nu. **5**.

page 12.

The classification for $n = 12$ and a partial classification for $n = 14$ have been obtained by G, Nebe & B. Venkov:
(1) *Low dimensional strongly perfect lattices. I: The 12-dimensional case*, L'Enseignement Mathématique **5**1 (2005), 129–163 ;
(2) *Low dimensional strongly perfect lattices. III: Dual strongly perfect lattices of dimension 14*, Int. J. Number Theory **6** (2010), 387–409.

7- (= 6-) designs: add to JM
(3) *On lattices whose minimal vectors form a 6-design*, European J. Combin. **30** (2009), 716–724.

…/…

pages 13 and 14.
More results on modular lattices can be read in
R. Scharlau, R. Schulze-Pillot, *Extremal lattices*, in Algorithmic Algebra and Number Theory, B.H. Matzat, G.-M. Greul, G. Hiss ed., Springer-Verlag, Heidelberg (1999), 139–170.
G. Nebe has recently constructed an extremal unimodular lattice of dimension 72: *An even unimodular* 72*-dimensional lattice of minimum* 8, preprint, Aachen (August 11th, 2010), 10 pp.

page 15.
"Probably ...": this has been solved in
Christine Bachoc, *Designs, groups and lattices*, J. Théorie Nombres Bordeaux **17** (2005), 25–44.

pages 16 and 17.
The tables are due to Batut and Venkov. No new strongly perfect lattices in dimensions $n \leq 24$ have been found since Venkov's paper on spherical designs was written.