

# A Spectral Characterization of Strongly Distance-Regular Graphs with Diameter Four.

M.A. Fiol

<sup>b</sup>Universitat Politècnica de Catalunya, BarcelonaTech  
Dept. de Matemàtica Aplicada IV, Barcelona, Catalonia  
(e-mail: [fiol@ma4.upc.edu](mailto:fiol@ma4.upc.edu))

## Abstract

A graph  $G$  with  $d + 1$  distinct eigenvalues is called strongly distance-regular if  $G$  itself is distance-regular, and its distance- $d$  graph  $G_d$  is strongly-regular. In this talk we discuss the case of diameter  $d = 4$ , and present a new spectral characterization of those distance-regular graphs with such a diameter which are strongly distance-regular.

*Keywords:* Distance-regular graph; Strongly distance-regular graph; Spectrum.

## References

- [1] A.E. Brouwer, Distance regular graphs of diameter 3 and strongly regular graphs, *Discrete Math.* **49** (1984) 101–103.
- [2] A.E. Brouwer, A.M. Cohen, and A. Neumaier, *Distance-Regular Graphs*, Springer-Verlag, Berlin-New York, 1989.
- [3] A.E. Brouwer and W.H. Haemers, *Spectra of Graphs*, Springer, 2012; available online at <http://homepages.cwi.nl/~aeb/math/ipm/>.
- [4] M.A. Fiol, A quasi-spectral characterization of strongly distance-regular graphs, *Electron. J. Combin.* **7** (2000), #R51.
- [5] M.A. Fiol, Some spectral characterization of strongly distance-regular graphs, *Combin. Probab. Comput.* **10** (2001), no. 2, 127–135.