

Maurice Lévy's original contribution to the analysis of masonry domes

Giacomo Tempesta¹, Michele Paradiso², Stefano Galassi³, Eva Pieroni⁴

Abstract In the fourth section of his book “*La statique graphique et ses applications aux constructions*”, Chapter II, Cupoles en maçonnerie, published in Paris in 1888, Maurice Lévy deals with the problem related to the stability of masonry domes provided with variable thickness. Lévy's idea is based on the fact that in any dome there are two types of behaviour: the first refers to the portion of shell where, both along the meridians and parallels, there are only compressive stresses, the second one relates to the part in which the parallels are in traction. The unknown of the problem is to determine the location of the parallel with respect to which the transition occurs between the two different conditions, that is what Lévy calls the “*point neutre*”. Lévy suggests the use of an original graphical method, that he describes in detail, whose initial setting is largely due to a previous work of H. T. Eddy.

Keywords masonry dome, graphical methods, limit analysis

¹ Giacomo Tempesta, Dip di Costruzioni e Restauro, University of Florence, Italy, giacomo.tempesta@unifi.it.

² Michele Paradiso, Dip. di Costruzioni e Restauro, University of Florence, Italy, michele.paradiso@unifi.it.

³ Stefano Galassi, Dip. di Costruzioni e Restauro, University of Florence, Italy, stefano.galassi@unifi.it.

⁴ Eva Pieroni, Dip. di Costruzioni e Restauro, University of Florence, Italy, betulla.dt@alice.it