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Wind loading on catenary domes

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ABSTRACT

The research aimed at understanding the pressure patterns induced by wind loading on thin shelled catenary dome structures. This unique shape of a “catenary” is able to further optimise material usage by only transmitting compressive stresses within the shape. A circular dome was tested along with the catenary domes to ensure the external wind pressure distributions were in agreement with previously conducted research on circular domes. Once validated, this research will be valuable in design, as there is no guidance given on wind pressures for catenary domes. Codes used by engineers provide external pressure coefficients for vaulted circular roofs with rectangular bases and for circular domes with circular bases. If external pressure coefficients are made available for catenary domes, this may offer guidance in design.