

FLYING MASTS IN NEXORADE NETS

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Abstract

This research has been carried out with the purpose of studying the structural behavior of the reciprocal frames called nexorades, in combination with cable-braced columns or "flying masts". The combination of the two systems presents significant structural improvements and provides a new model of construction that has been little studied in the specialized bibliography. For the case study, a truncated icosahedron was used as the base model from which, using laminated wood plates in active bending, the reciprocal frame was created. This reciprocal frame is used as a fastening point for the cables that support the flying masts. The entire structure is covered using high-strength architectural textiles that are attached to the tips of the flying masts. For the verification of the advantages of the proposed system, uniform and non-uniform load tests have been carried out in digital and real models making a direct comparison between the nexorade with and without flying masts, in both tests has been seen an improvement in rigidity greater than 50%. Special emphasis was placed on the creation of a structural system of easy fabrication and assembly, achieving a prototype that can be built without special tools, easy to transport, scalable and that can be assembled with a minimum of human resources and tools.



Figure 1: 1:6 mockup and full-scale dome models.

References

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