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CAOS: Mechanical details and studies of the Vacuum Towers under construction.

The CAOS facility in Perugia serves as a specialized lab for testing mechanical and optical systems for the Einstein Telescope (ET). It will host a seismic-isolated Fabry-Perot cavity. The current research and development efforts include testing ET's full-sized Super Attenuators, creating integration tools and procedures for lateral-entry payload access at the base of the tower, and evaluating NEG pumps within Super Attenuator environments.
Two 15-meter-high stainless steel towers are currently being constructed. Extensive use of Finite Element (FE) techniques has refined the towers' mechanical design, addressing both static and dynamic loads. The designs have been optimized based on Von Mises stress analyses and mechanical resonance frequencies. This presentation will detail the mechanical solutions adopted for the towers and the Finite Element analysis methods used during the design phase.

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