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Directional Analysis of Extreme Winds under Mixed Climate Conditions

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Abstract

Directional statistics provide design engineers with the opportunity to realise considerable cost savings, but these are not yet provided for in the South African standard for wind loading. The development of the directional statistics of extreme winds is complicated by the various strong wind mechanisms and their related unique directional characteristics. It is imperative to select appropriate directional sector sizes, to accommodate the full-scale impact of the most dominant extreme wind mechanism(s). The interaction between the directional ranges of the strong wind mechanisms and the sector sizes ultimately determine the discrepancies between the directional and omni-directional mixed climate quantile estimations.