

Discussion

Errors in GEV analysis of wind epoch maxima from Weibull parents

by R.I. Harris, *Wind and Structures*, Vol. 9, No. 3 (2006) 179-191.

Discussion by E. Simiu[†]

National Institute of Standards and Technology Gaithersburg, MD 20899-8611, USA

One basic question that needs to be raised in an extreme wind speed estimation context is whether parent populations can be clearly identified. To this discussor's knowledge this is not the case for hurricane or thunderstorm winds. Whether parent populations can in general be identified for "straight winds" remains to be ascertained, in spite of the particular case of Fig. 1.

The discussor's argument on convergence is well taken, but it would have been useful for the author to discuss it in the paper, at least briefly, for the case of the Type I Extreme Value distribution as well. Similar convergence issues may arise for this case, and it is still not clear why convergence concerns applicable to a Type III distribution estimated by a GEV analysis would not be equally applicable to a Type I which, after all, can be regarded as a particular case of the GEV family of distributions.

The author's arguments are predominantly concerned with extreme value statistics issues that are not specific to wind engineering, but rather pertain to statistical issues of much more general scope. For this reason, as he has done in the past, the discussor would suggest that the author submit those arguments to statistics journals for proper scrutiny by professional extreme value statisticians, rather than publishing or offering papers to wind and structural engineering journals. Judging by the references listed in the author's paper, so far he appears not to have done so.

Among the four reasons that, in his opinion, may motivate the proponents of the reverse Weibull distribution tail, the author mentions "continual commercial pressure to reduce wind loads." In fact, basic extreme load estimates from presumed "parents" can yield *unsafe* estimates of extremes, as noted by Isyumov, *et al.* (2003) in connection with estimation methods based on up-crossing theory and still used by some wind tunnel operators. The discussor believes that the motivation for adopting extreme wind speed models other than the Type I distribution stems from a genuine desire on the part of statisticians and wind engineers to develop models that are appropriate, a desire they share with the author, who should be congratulated for his efforts to understand the probabilistic, statistical, and physical elements of this difficult issue.

[†] NIST Fellow, E-mail: emil.simiu@nist.gov

References

Isyumov, N., *et al.* (2003), "Predictions of wind loads and response from simulated tropical storm passages", *Proceedings, 11th International Conference on Wind Engineering*, Lubbock, TX, D. Smith and C.W. Letchford, eds., June 2-5, 2003.

JH