Natural Hazards
and Earth System
Sciences

Open Access

Discussions

EGU

Interactive
Comment

Interactive comment on "Hazard function theory for nonstationary natural hazards" *by* L. K. Read and R. M. Vogel

L. K. Read and R. M. Vogel

laurareads@gmail.com

Received and published: 3 March 2016

Reviewer: GENERAL COMMENTS

In this article the authors propose to extend classical approaches based on peak over threshold (POT) methods and generalized Pareto distribution models to the case of nonstationary processes modeling natural hazards. The main ingredient is based on the use of the hazard function analysis in order to construct a relation between the exceedance probability of the natural hazard end the time to failure. The article is clearly written and the bibliographic discussion is very complete. However there is a point which needs to be clarified before the article can be accepted for publication. The authors indeed extend the relation linking the hazard function h(t) to the exceedance

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

probability p0 to the nonstationary case by writing: h(t) = pτ . This relation has to be justified.

Authors: The authors agree that the relationship h(t) = pτ is an assumption which needs to be verified in the paper. We have verified this assumption in two ways:

First, by comparing results from the HFA with the independent approach introduced by Olsen et al. [1998] and others (presented in Cooley, 2013; Salas and Obeysekera, 2014; Read and Vogel, 2015), who introduce an equation for computing the pdf and moments of the return period for nonstationary processes; and second through Monte Carlo experiments in which we generated nonstationary series arising from a 2-parameter Generalized Pareto distribution, and then compare sequences of exceedance probabilities associated with a particular design event, for a plausible range of cases with h(t) derived using the HFA equations. We obtain exact agreement in both cases thus we believe that we have verified this important assumption. We appreciate the reviewer bringing this issue to our attention and have added a discussion in section 1.2 that details our assumption and the methods we have used to verify it for the case presented in this paper.

Reviewer: As a minor remark the reviewer thinks that the use of 2 symbols for denoting time, t and τ could be confusing and suggest to drop either one. Moreover, if τ denotes a fixed value of time, relations (1) to (3) page 6890 should be written in terms of τ instead of t.

Authors: The authors agree with the remark on notation and have removed the use of τ in this paper. We agree that this modification improves clarity of the work.