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Project Acronym: SHARE

SP 1-Cooperation

Collaborative project: Small or medium-scale focused research project

THEME 6: Environment

Call: ENV.2008.1.3.1.1 Development of a common methodology and tools to evaluate earthquake hazard in Europe

D3.6 – Logic Tree of Seismic Source Zones

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Revision: 1

Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	x

1. Structure of logic tree of seismic source zones

The here presented logic tree follows decisions taken in the October 2010, Potsdam, and May 2011, Zürich, SHARE WP5 model building workshops.

The SHARE D 3.6 logic tree of seismic source zones is divided into two levels. Firstly the tree of the seismic source model (Figure 1) follows decisions taken at the October 2010 Potsdam model building workshop where the initial structure of the logic tree was decided and later delivered as deliverable D5.2 (Grünthal et al., 2010). For details on the structure of the logic tree see Grünthal et al., (2010). The source model is branched into three different parts, firstly an areal source model, secondly for part of the SHARE area a fault based model with background sources and thirdly a zoneless source model. The current deliverable is regarding the zone-based part of the model. Further, it was decided in the May 2011, Zürich, model building workshop, that weighting is to be finalized in coming workshops.

The second level of the branching of the areal source model (D3. 1) is at the source zone level and is depicted in Figures 2-5. This logic tree follows the status decided upon the model building workshop in Zürich, May 2011. At the source zone level the specific parameters M_{max} activity rates and GMPEs are branched and subject to other deliverables. This logic tree will be applied to the source zone model D3.1 (Arvidsson and Grünthal, 2010) for each source zone.

M_{max} is divided into two main parts with two branches for active regions (Figure 2) and subduction zones (Figure 3) and four branches for stable continental regions (Figures 4-5) as decided in the May 2011, Zürich, model building workshop.

The ground motion prediction equation (GMPE) as part of the logic tree is not a result of the current workpackage but is a separate deliverable by WP4 but also shown for completeness reasons. The GMPEs shows the status as of May 2011.

According to needs within the project modifications can be made to the logic tree for seismic sources. Especially the final weighting of different branches of the logic tree will be decided according to the PSHA calculations during course of the project.

Logic tree at source model level

principal
methodology:

zone-based
zoneless

model specification
in sub-area

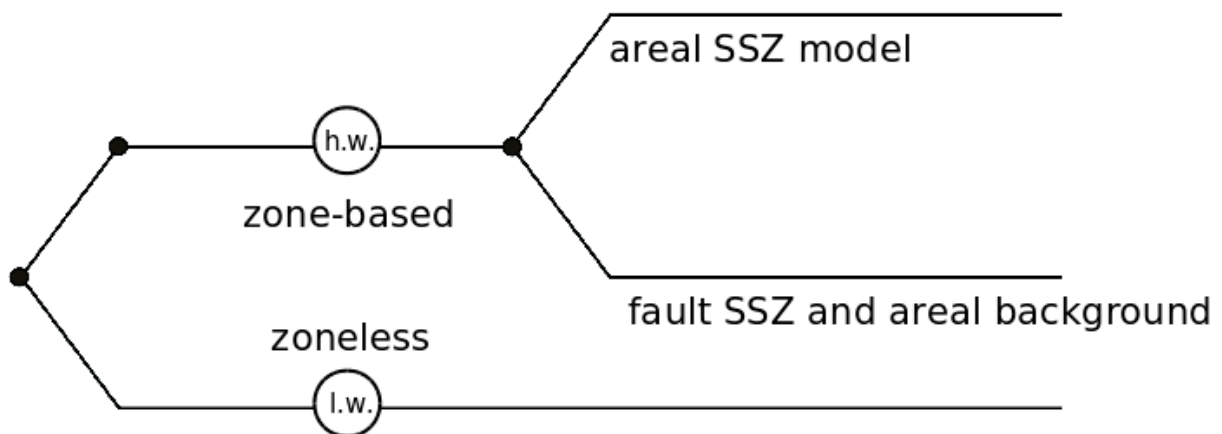


Figure 1. Logic tree at source model level. The weighting h.w. (high weight) and l.w. (low weight) is only an example. The actual weighting will be decided upon in coming workshops as decided in the Zürich, model building workshop.

Logic tree structure for each seismic source zone

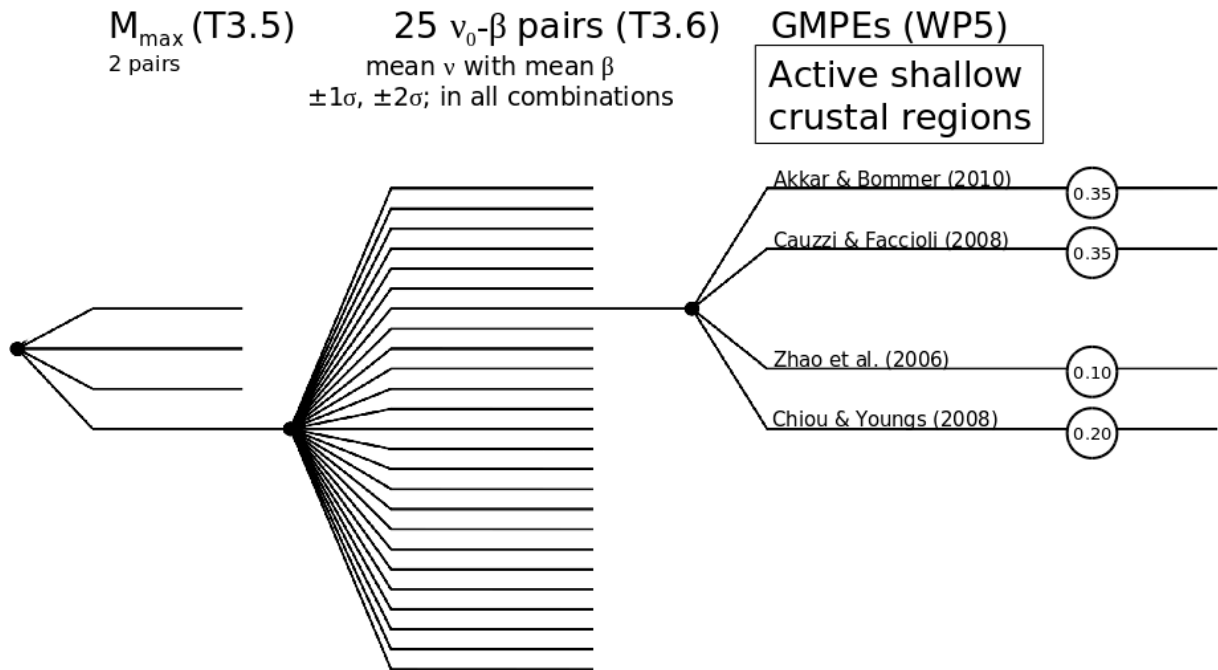


Figure 2. Logic tree at source zone level.

Logic tree structure for each seismic source zone

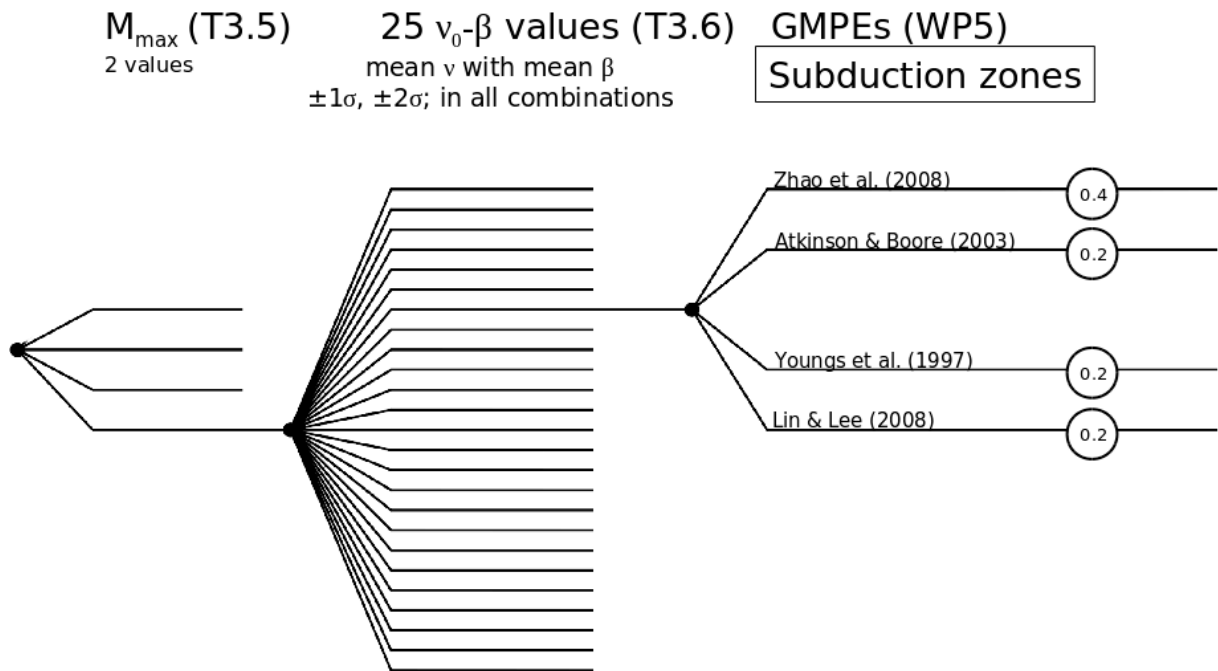


Figure 3. Logic tree at source zone level.

Logic tree structure for each seismic source zone

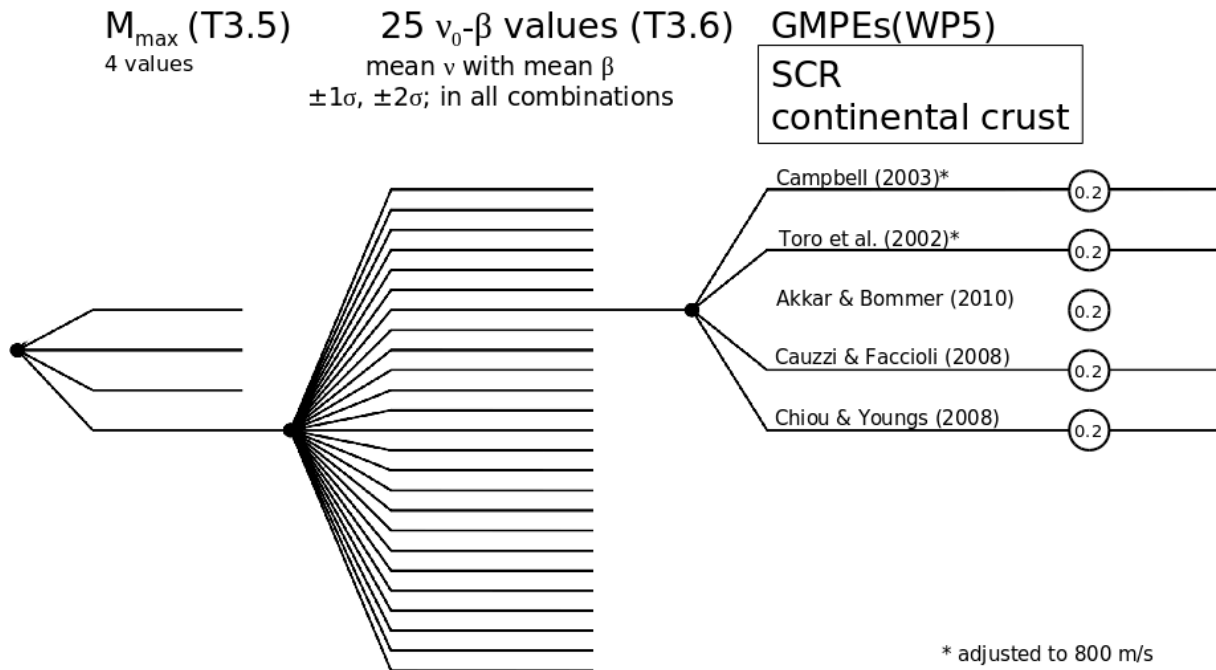


Figure 4. Logic tree at source zone level.

Logic tree structure for each seismic source zone

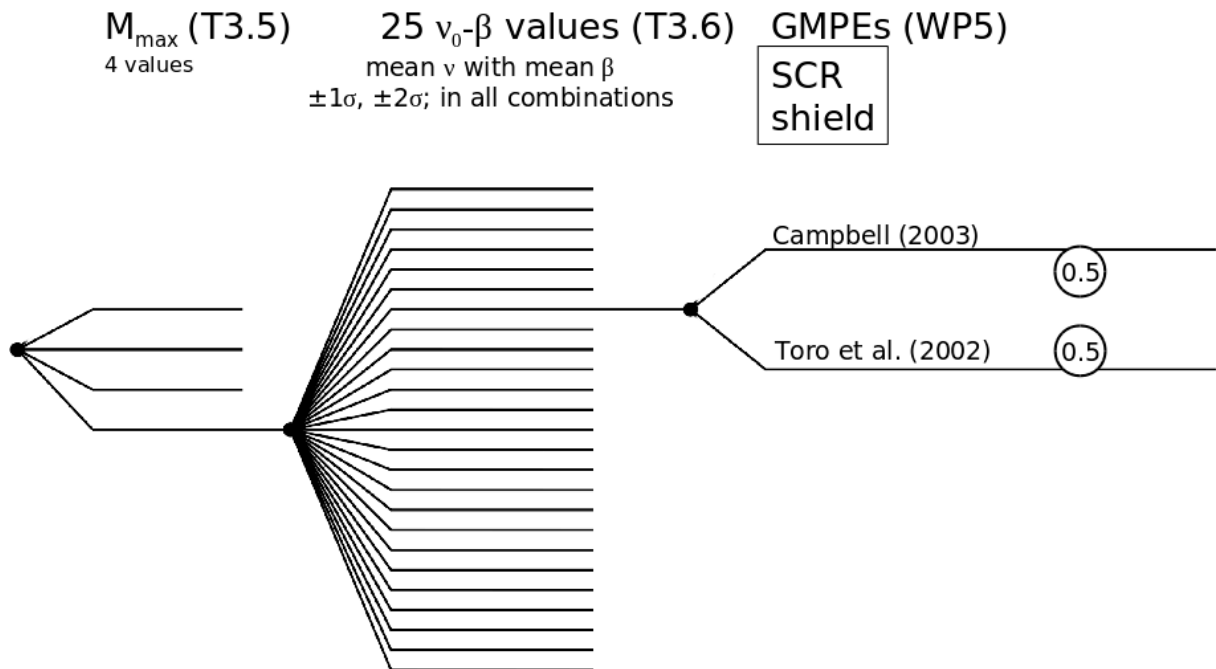


Figure 5. Logic tree at source zone level.

2. References

Arvidsson, Grünthal and the SHARE working group on seismic sources, 2010. Compilation of existing regional and national seismic sources. SHARE Deliverable D3.1, 19pp.

G. Grünthal, R. Arvidsson, D. Stromeyer, C. Bosse, and M.B. Sørensen, 2010. Structure of the logic tree to be used in hazard computations. SHARE Deliverable D5.2, 11 pp.