

Moving Forward

SCEC BBP Validations &
Improvements

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Moving Forward with BBP:

- Schedule for major seismic hazard projects
 - Time Series for structural fragilities 2015
 - Use in 2016 nuclear fragilities
 - Use in 2016 California dams hazard update
 - NGA-west3 2018
 - Use in 2020 Building code
 - SWUS-2 & NGA-east2 2023
 - Use in 2025 Nuclear power plant hazard update

Moving Forward with BBP: Topics for Discussion

- New Features/Capabilities in BBP
- New/Improved Modules
- Validation – median
- Validation – aleatory variability

New Features in BBP

- Improve user input interface
 - Make easier to understand
 - Plots of inputs for checking before simulations are conducted
- Allow for non-planar ruptures
- Allow computation of GF within the BBP

New/Improved Modules

- Site amplification
 - Site effects in time series
- Improve simulation modules
 - UCSB, UNR, Irikura Recipe
 - $M(A)$ scaling limitations
 - Make the BBP modules work for
- Rupture Generators
 - Key for aleatory variability
 - Empirical event terms variability
 - Rupture source variability

Validation - Median

- 1-D crustal models
 - Complete validation for 3 EUS earthquakes
 - Complete validation for remaining 13 active crustal region earthquakes
 - Many are non-planar ruptures
- 3-D crustal models
 - Repeat validation using 3-D crustal models
 - What is the improvement compared to 1-D models?
 - Need 3-D GF for all regions in the validation data set

Validation – Aleatory Variability

- Calibrating rupture generator variability
 - Joint distributions of source properties
 - Hypocenter location, Slip, Slip velocity, Rupture velocity
 - Dynamic rupture models
 - Avoids inconsistent parameter combinations, but variability depends on inputs to the dynamic rupture model
 - Empirical models for M6 - M6.5

Possible Schedule

- 2014-2015
 - Improved user interface tools
 - Complete 1D validation for additional 13 ACR events
 - Revise/add modules (UCSB, UNR, Irikura, ...)
 - New site effects module
 - Relaxing M(A) scaling constraints
 - Add non-planar ruptures to BBP ??
 - Add 3-D simulations capabilities to BBP
- 2016-2017
 - 3-D Sensitivity runs outside the BBP
 - Source constraints from Dynamic rupture models
 - Rupture generators capturing plasticity effects
- 2018-2019
 - 3-D validation using BBP
 - Add 1-D GF calculation to BBP
 - Validation for aleatory variability