# CyberShake Study 15.4 Preliminary MCER Results

Scott Callaghan UGMS Meeting May 4, 2015

# Comparison of CyberShake Studies

Parameter	Study 14.2	Study 15.4
Frequency	0.5 Hz	1.0 Hz
Number of sites	286	40 (336 in study, to be completed July 31, 2015)
Rupture Generator	Graves & Pitarka (2010)	Graves & Pitarka (2014)
Fault surface discretization	1000 m	200 m
Vs min	500 m/s	500 m/s
Velocity Model	CVM-S 4.26	CVM-S 4.26
Earthquake Rupture Forecast	UCERF 2	UCERF 2

# Study 15.4 MCER sites

• 14 sites which are near locations of interest



# Study 15.4 LADT MCER results



# Comparison with Study 14.2



Study 15.4 (1 Hz)

Study 14.2 (0.5 Hz)

# LADT Study 15.4



← ASCE 7-10 Det Lower Limit ← GMPE MCER ← CyberShake MCER

### LADT Study 14.2



◆ ASCE 7-10 Det Lower Limit ◆ ASCE 7-10 Ch 11.4 ◆ GMPE MCER ◆ CyberShake MCER



<sup>←</sup> ASCE 7-10 Det Lower Limit ← GMPE MCER ← CyberShake MCER





<sup>←</sup> ASCE 7-10 Det Lower Limit ← GMPE MCER ← CyberShake MCER



#### STNI Curves, 2 sec



1 Hz simulation (Study 15.4) reduces effect of roll-off due to filtering

#### STNI Curves, 5 sec



Difference likely due to changes in rupture generator

# New Rupture Generator

- Graves & Pitarka, 2014
- Brought into agreement with Broadband Platform rupture generator
- # of realizations related to fault area, not length
  - Higher minimum number of realizations
- Each realization is unique hypocenter + slip
- Supports either uniform or random hypocenter distribution

### Hypocenter Locations



Puente Hills, M6.55



Southern San Andreas, M8.15