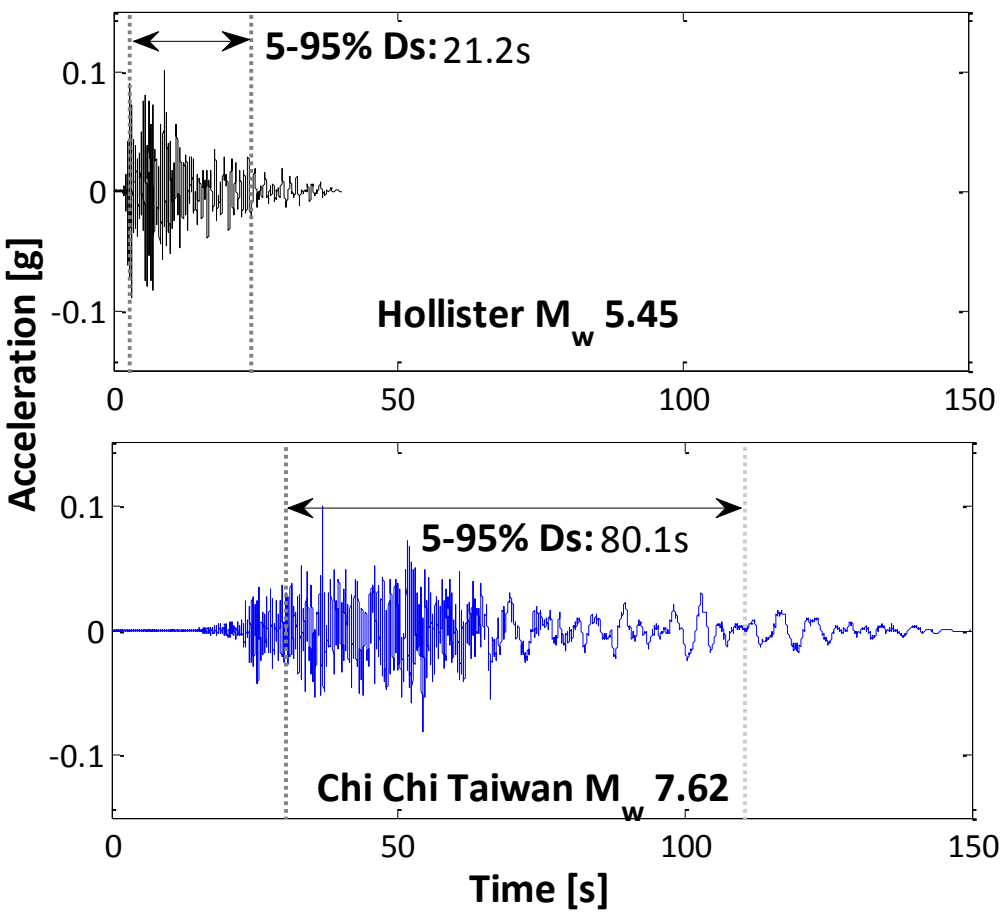
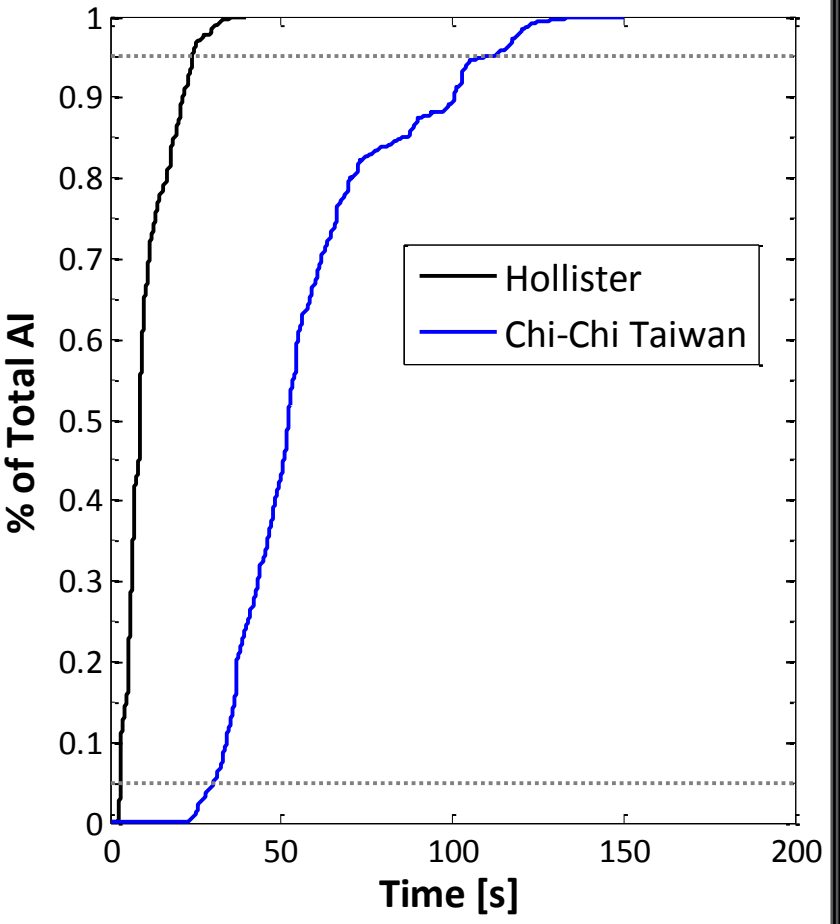
MARCH 22, 2012

EFFECTS OF LONG-DURATION SHAKING ON BUILDING COLLAPSE RISK

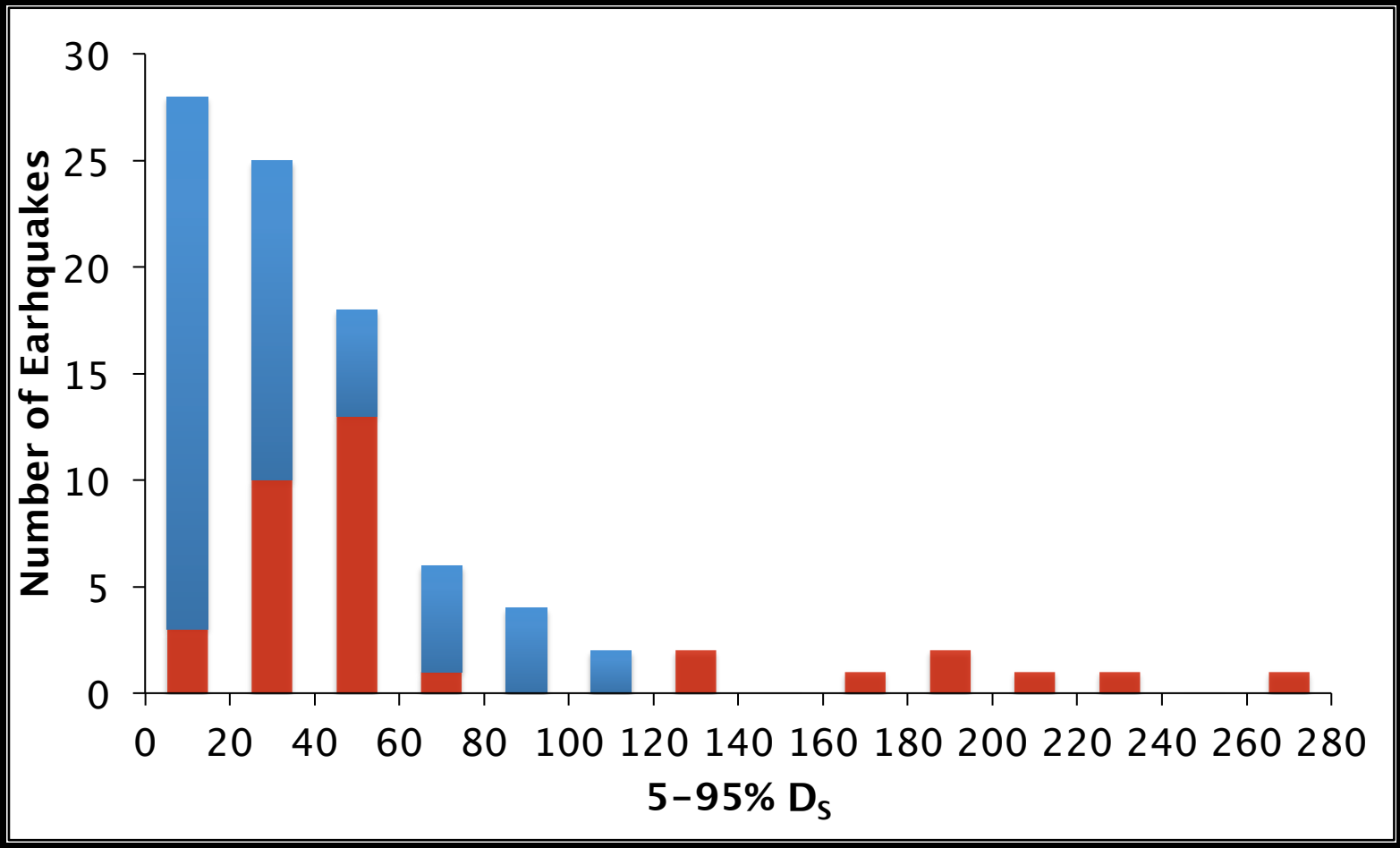
Abbie Liel, Ph.D., P.E. & Meera Raghunandan, Ph.D. Candidate
University of Colorado, Boulder

DEFINITION OF DURATION





GROUND MOTIONS



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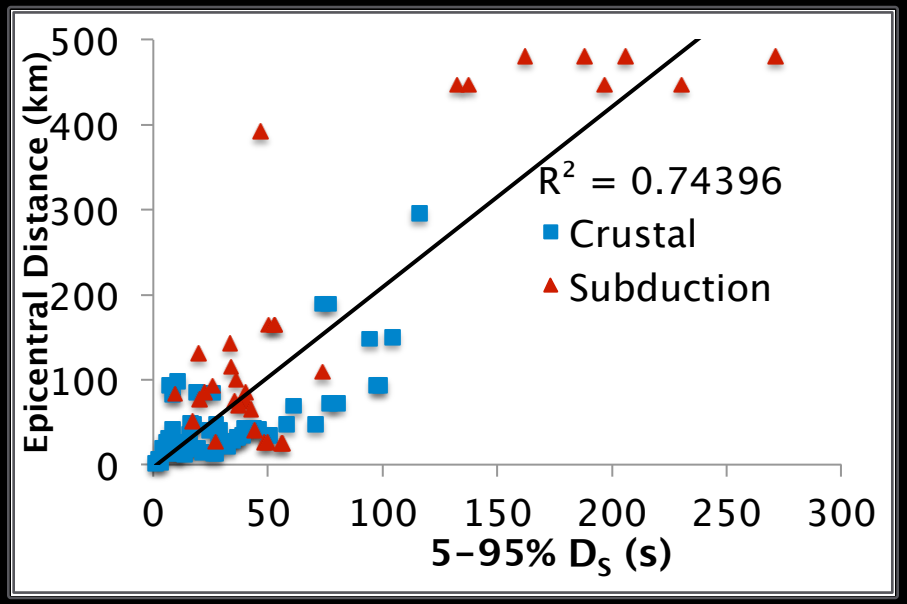
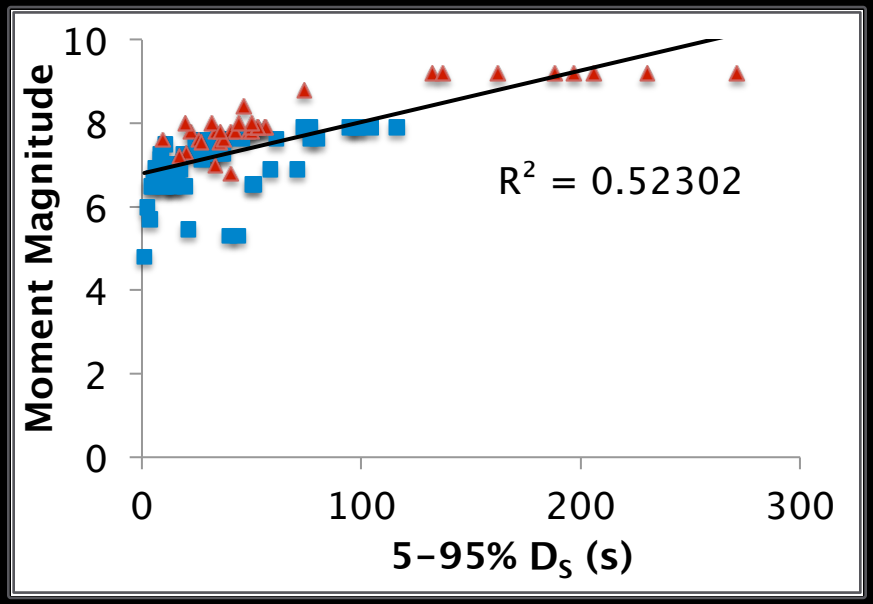
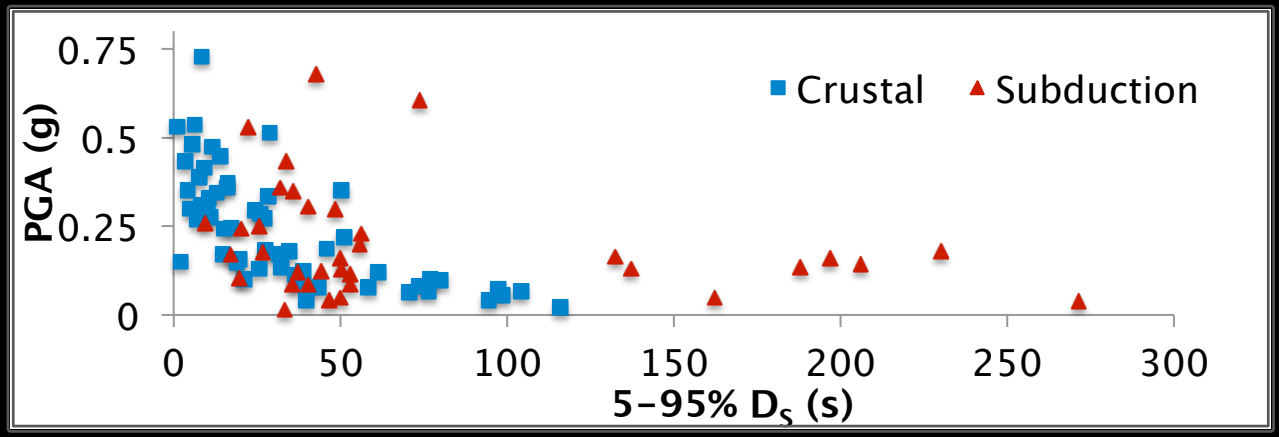


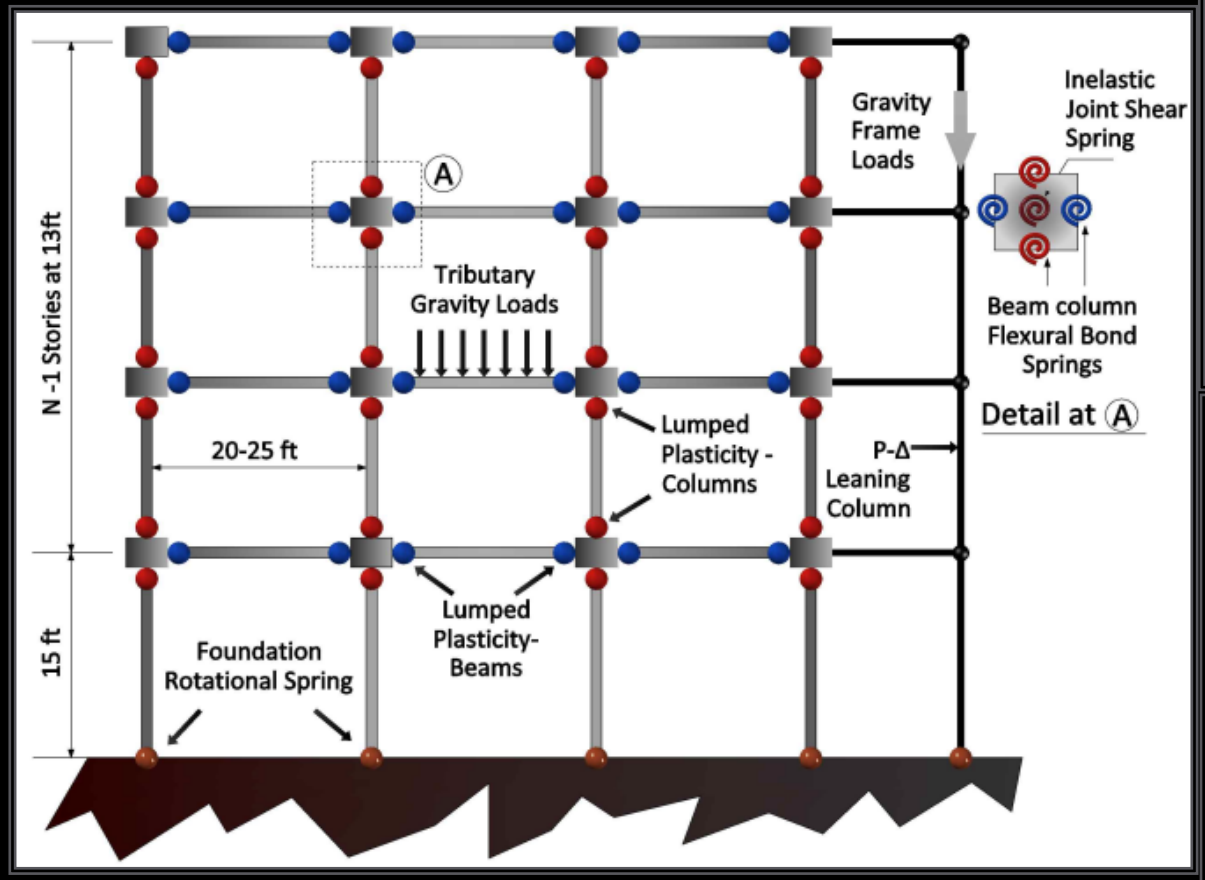


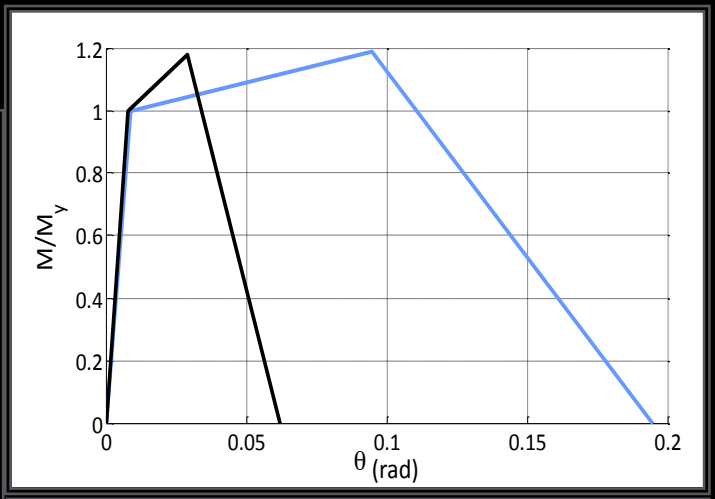


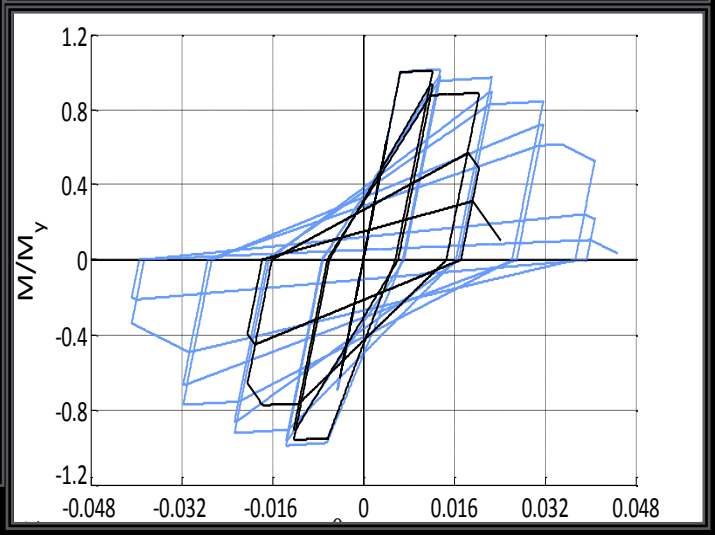
BUILDINGS ANALYZED

- Analyzed 20 concrete frame buildings
- Representative of modern and older buildings
- Varying ductility due to design/detailing differences
- Varying height (1 to 20 stories)

NONLINEAR SIMULATION MODELS

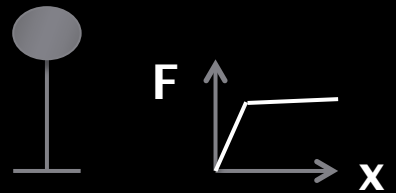




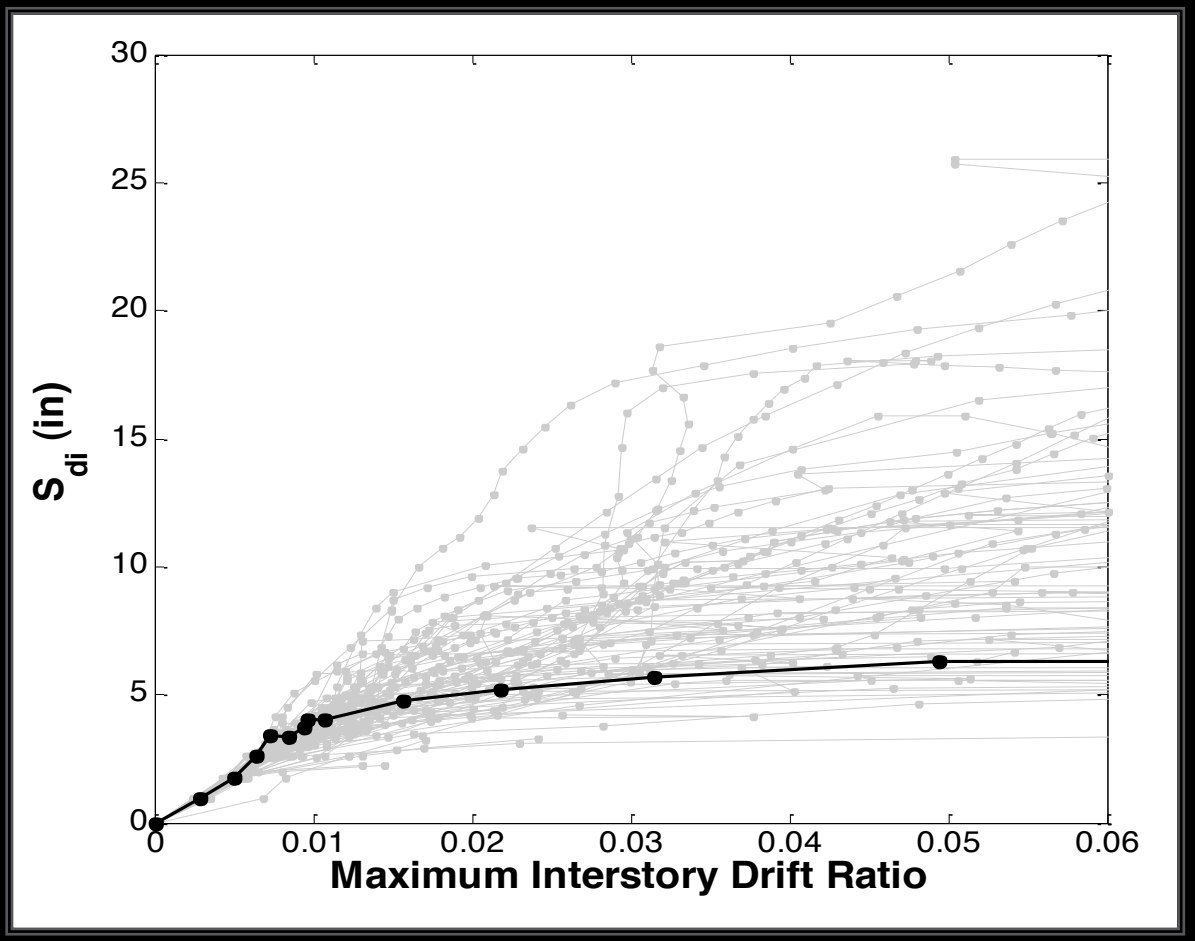


NONLINEAR ANALYSIS

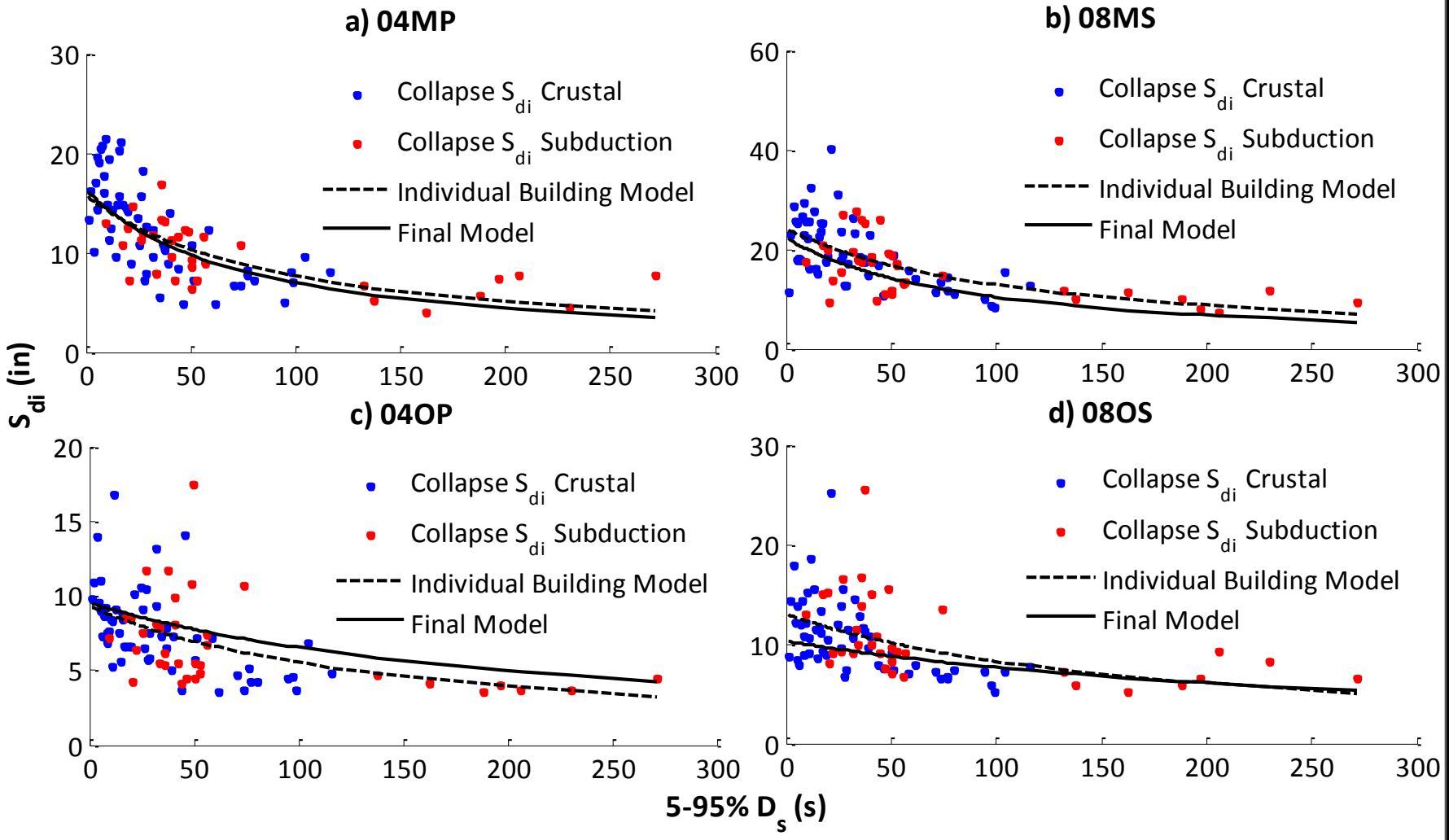
Goal: To predict structural collapse response as a function of **ground motion intensity** and duration



S_{di} used as ground motion intensity measure based on bilinear oscillator



TRENDS BETWEEN COLLAPSE CAPACITY AND DURATION



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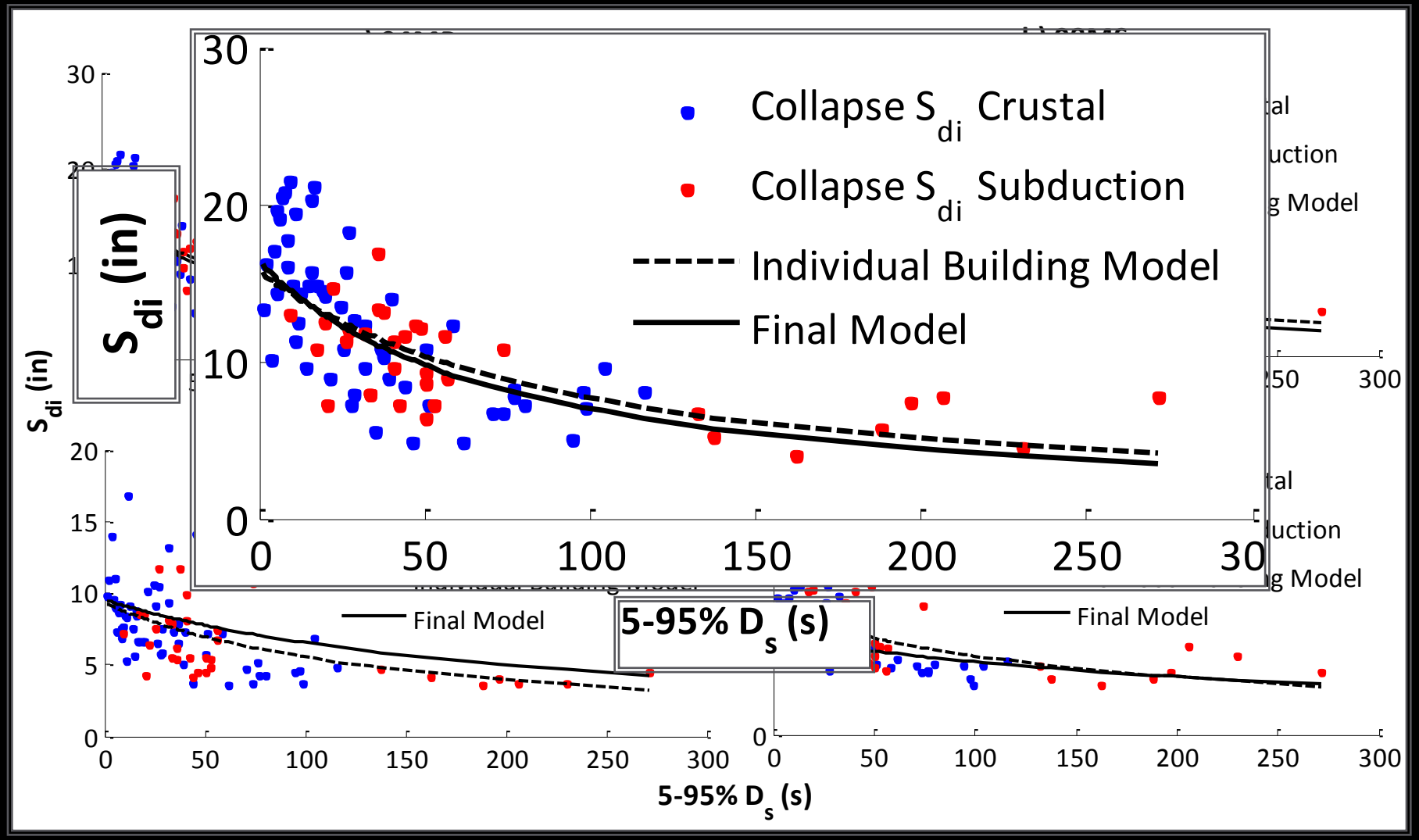
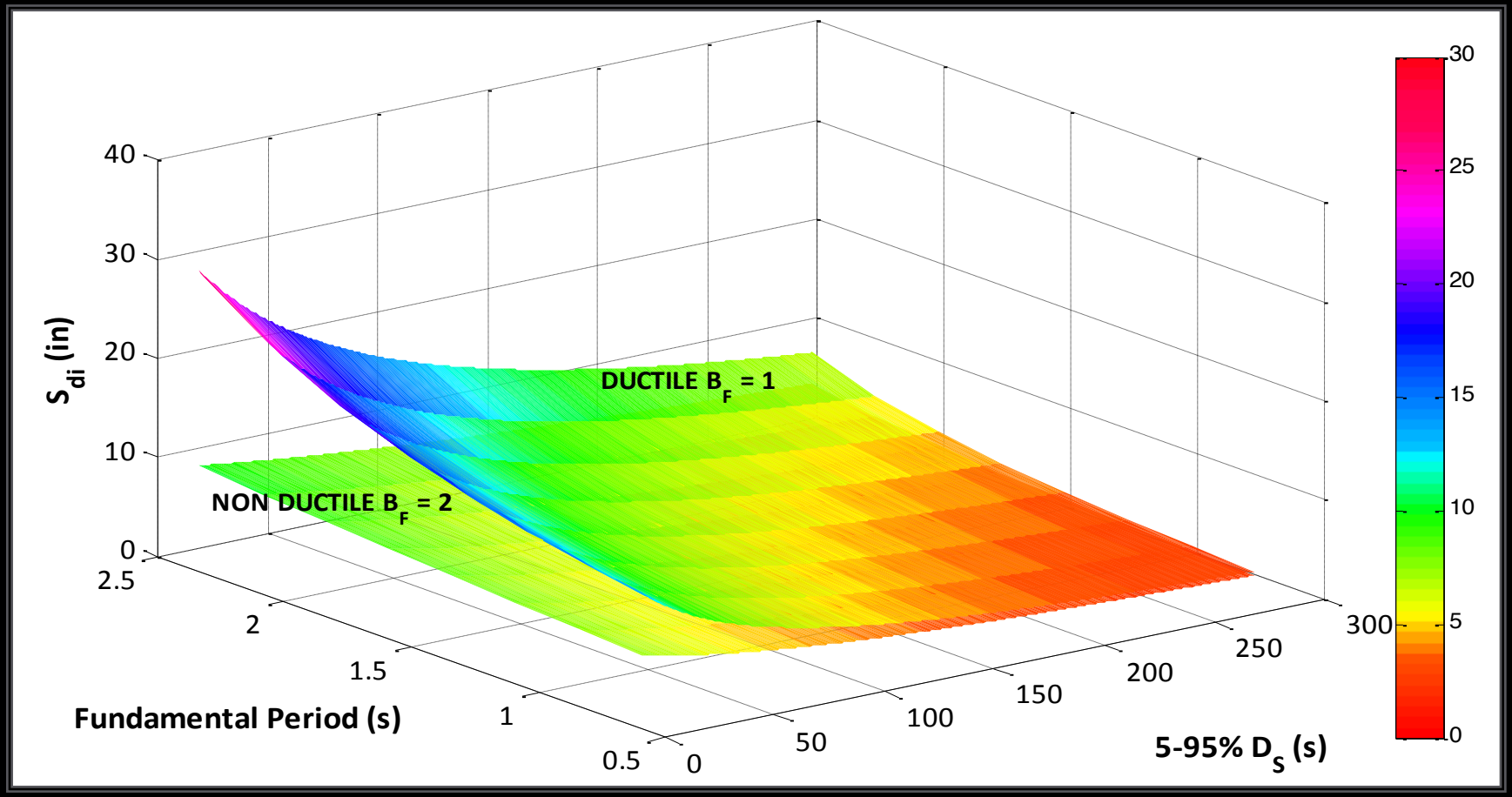
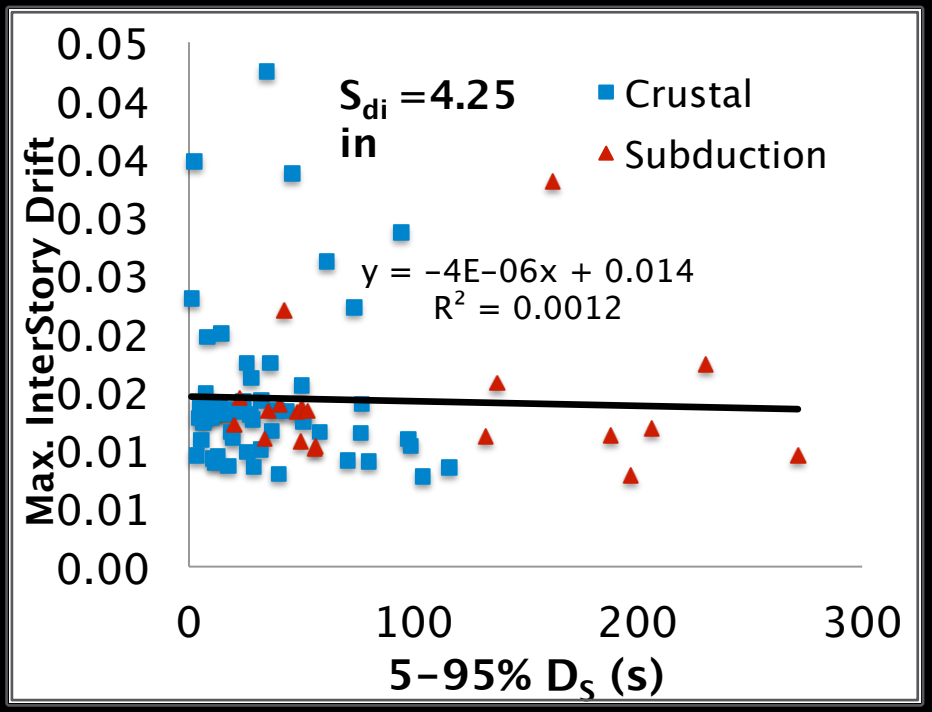
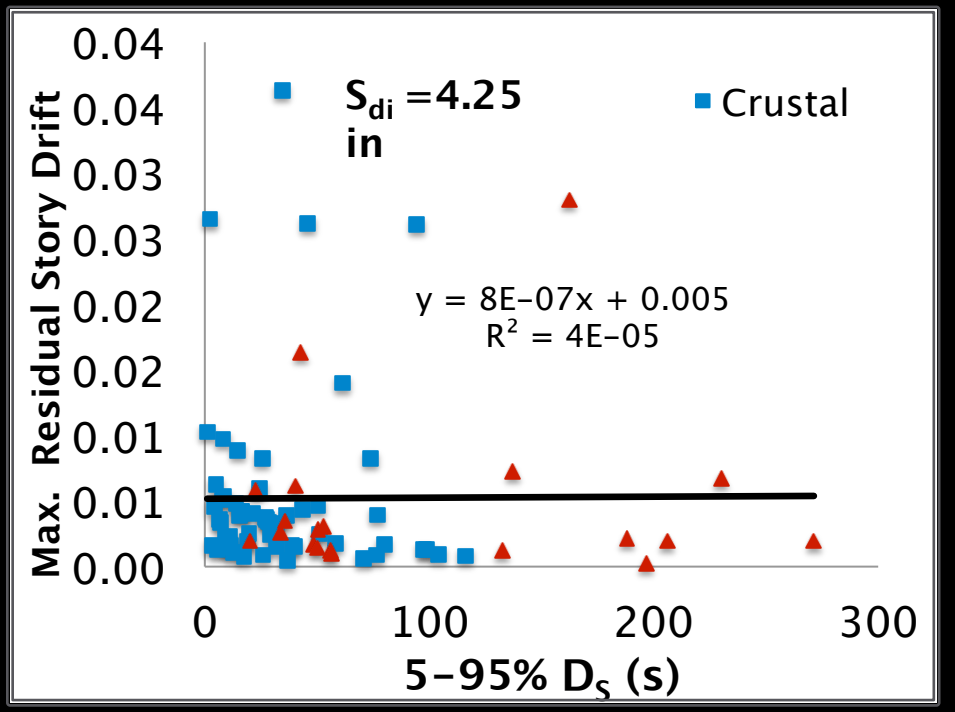


REGRESSION MODEL



HOW DOES DURATION IMPACT STRUCTURAL RESPONSE?





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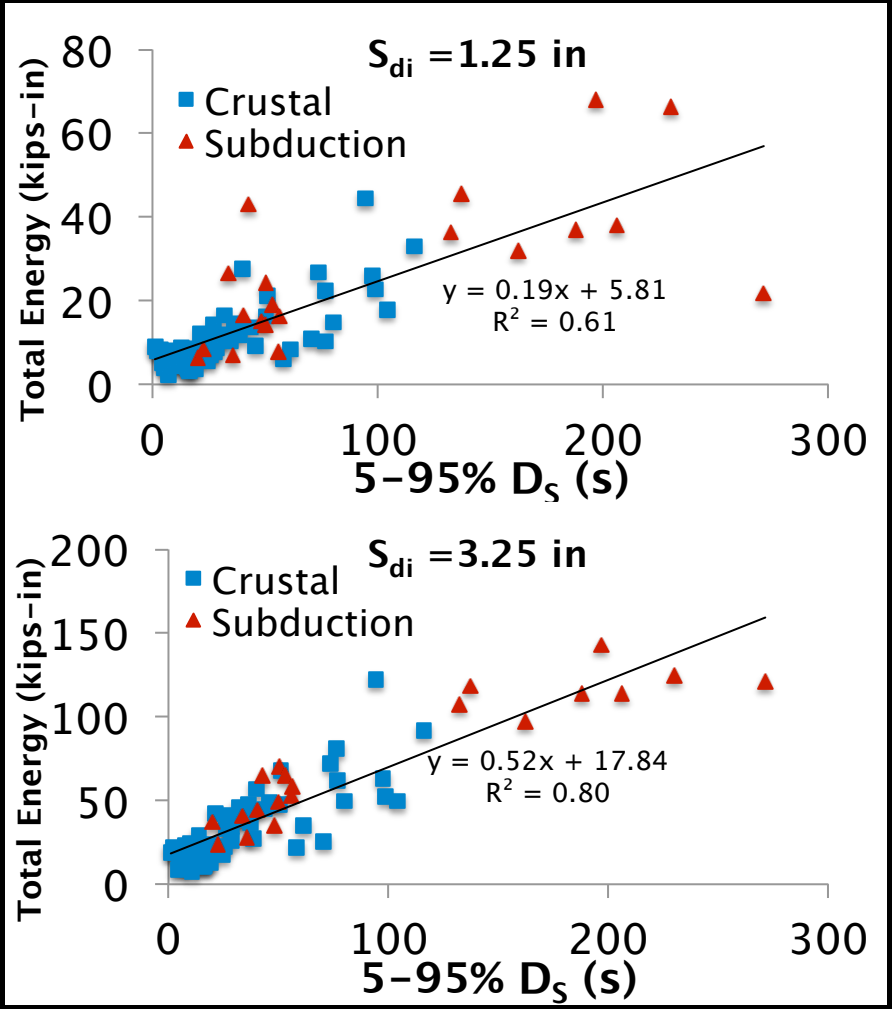

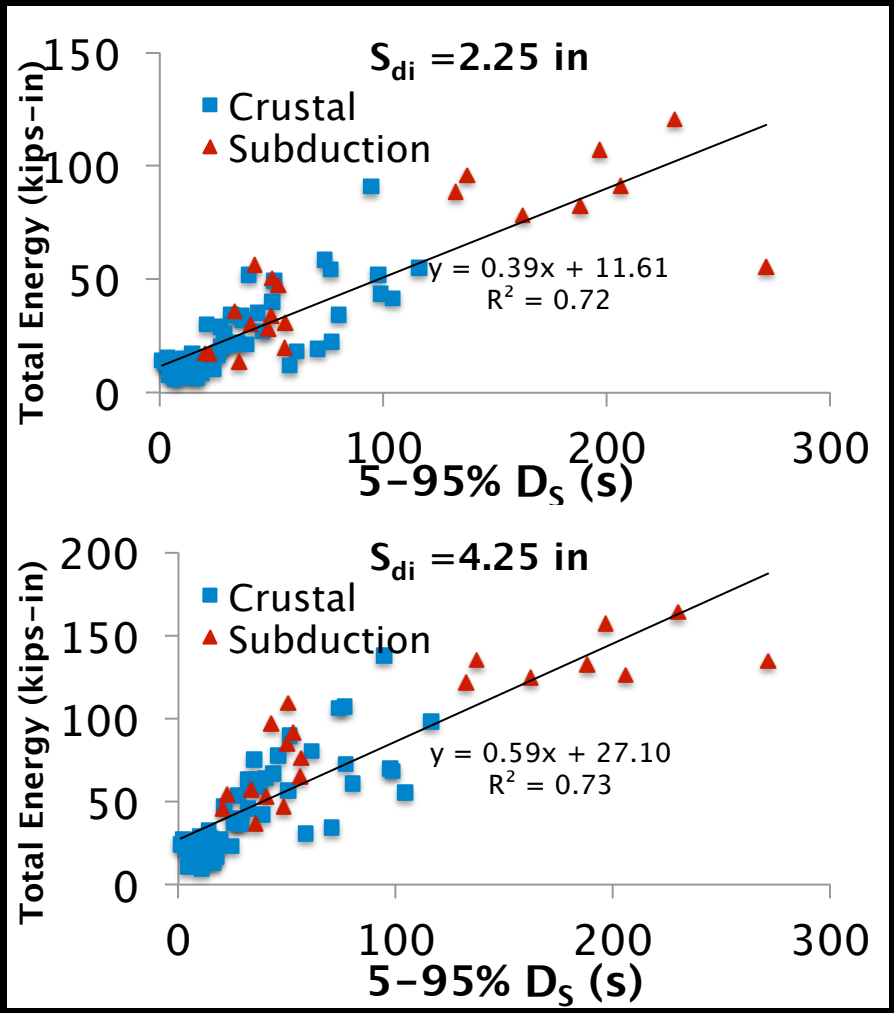

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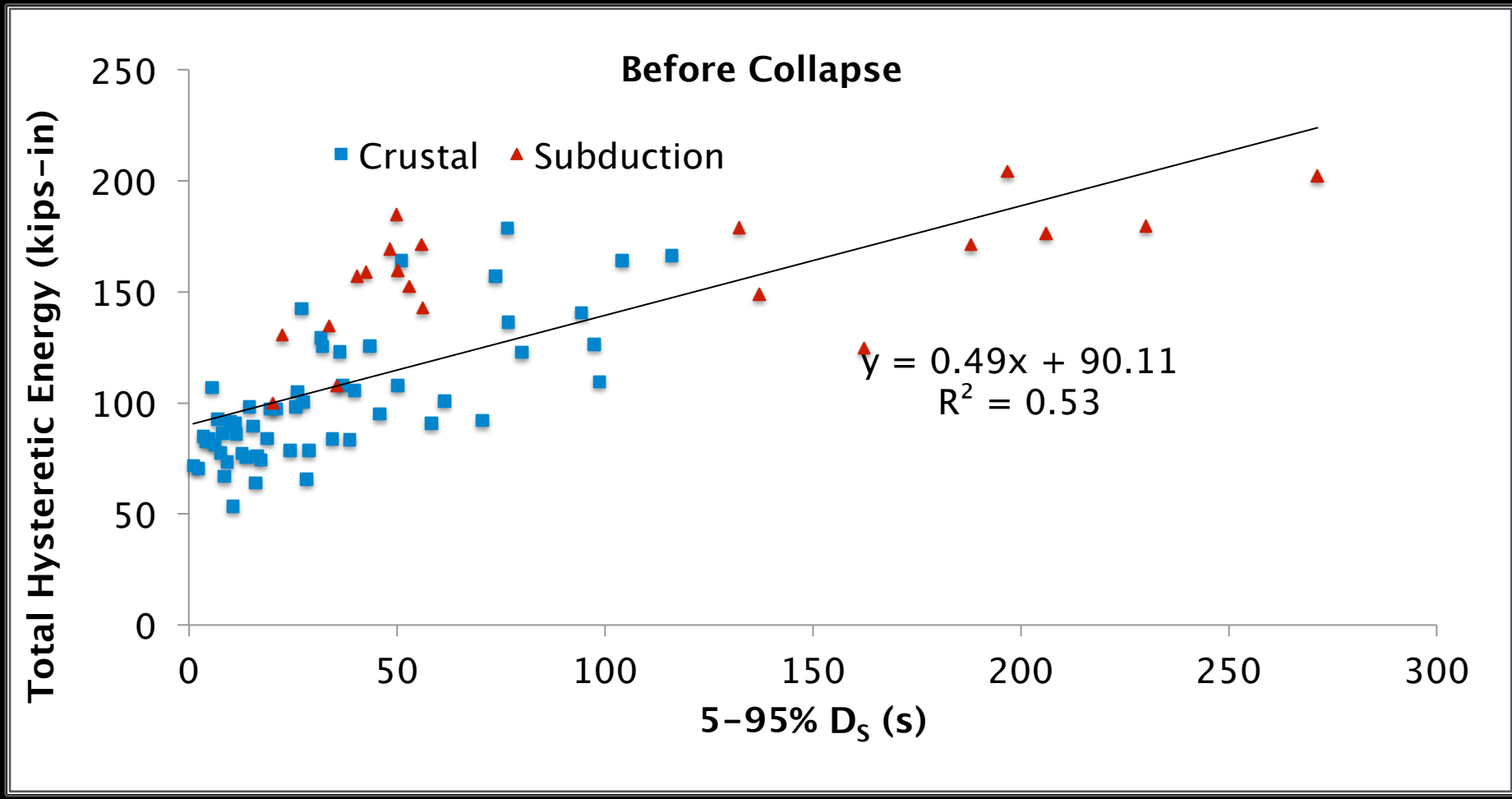

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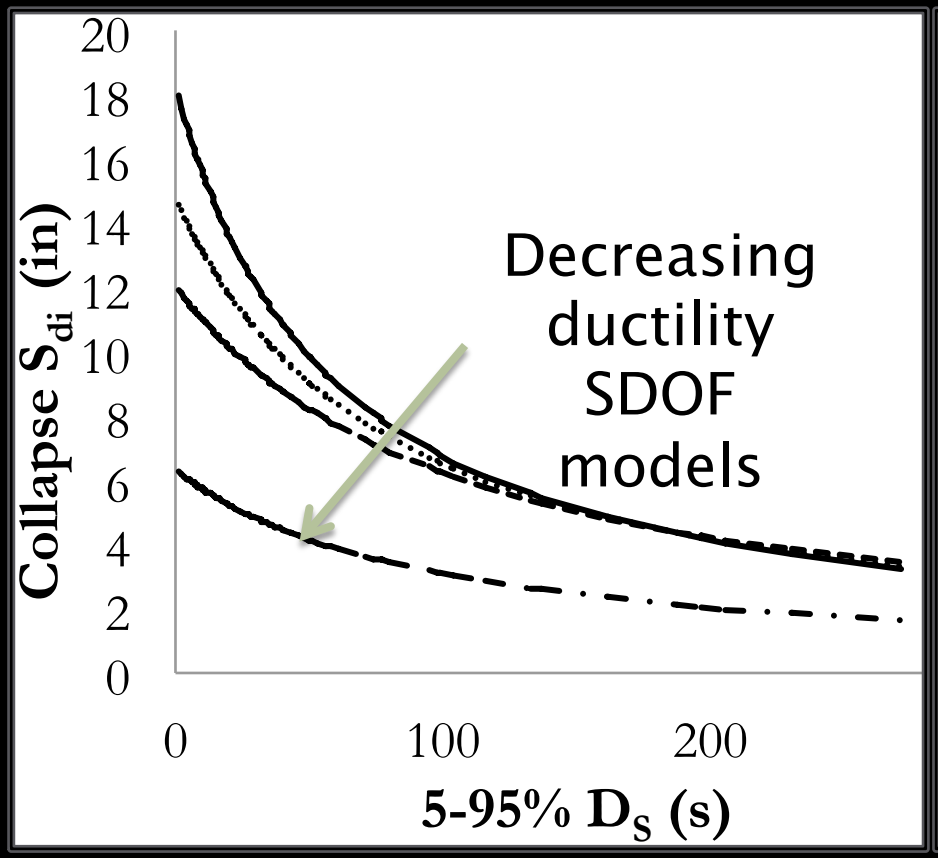
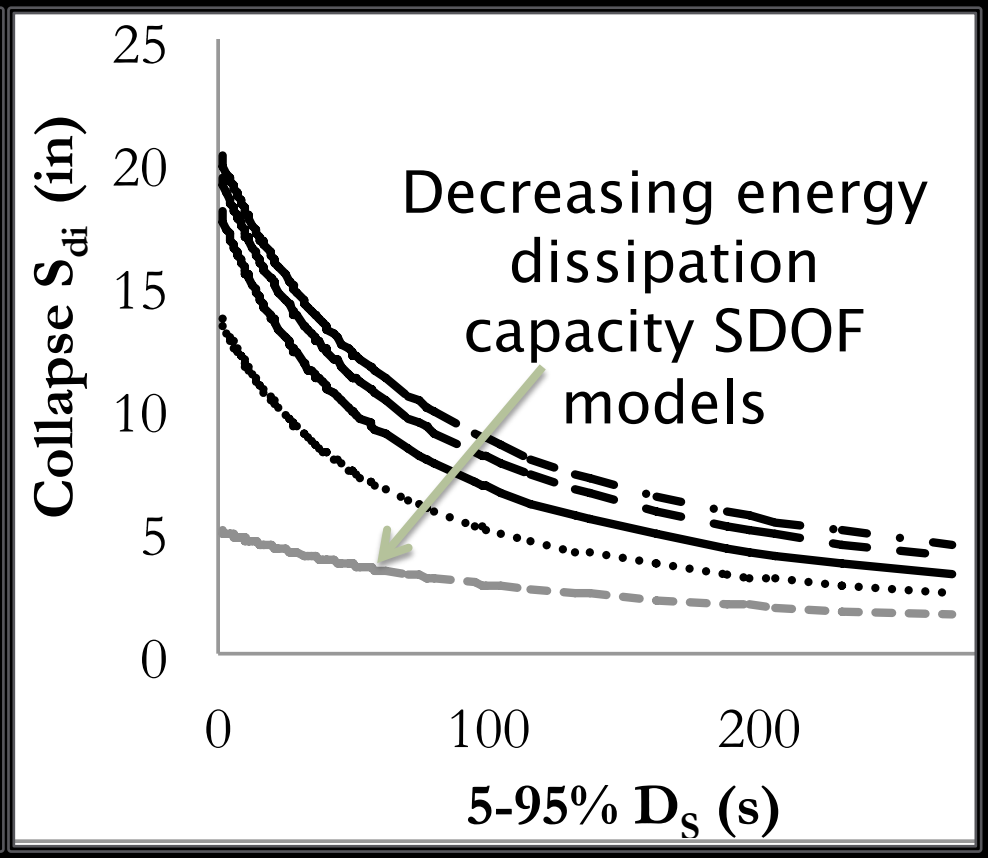
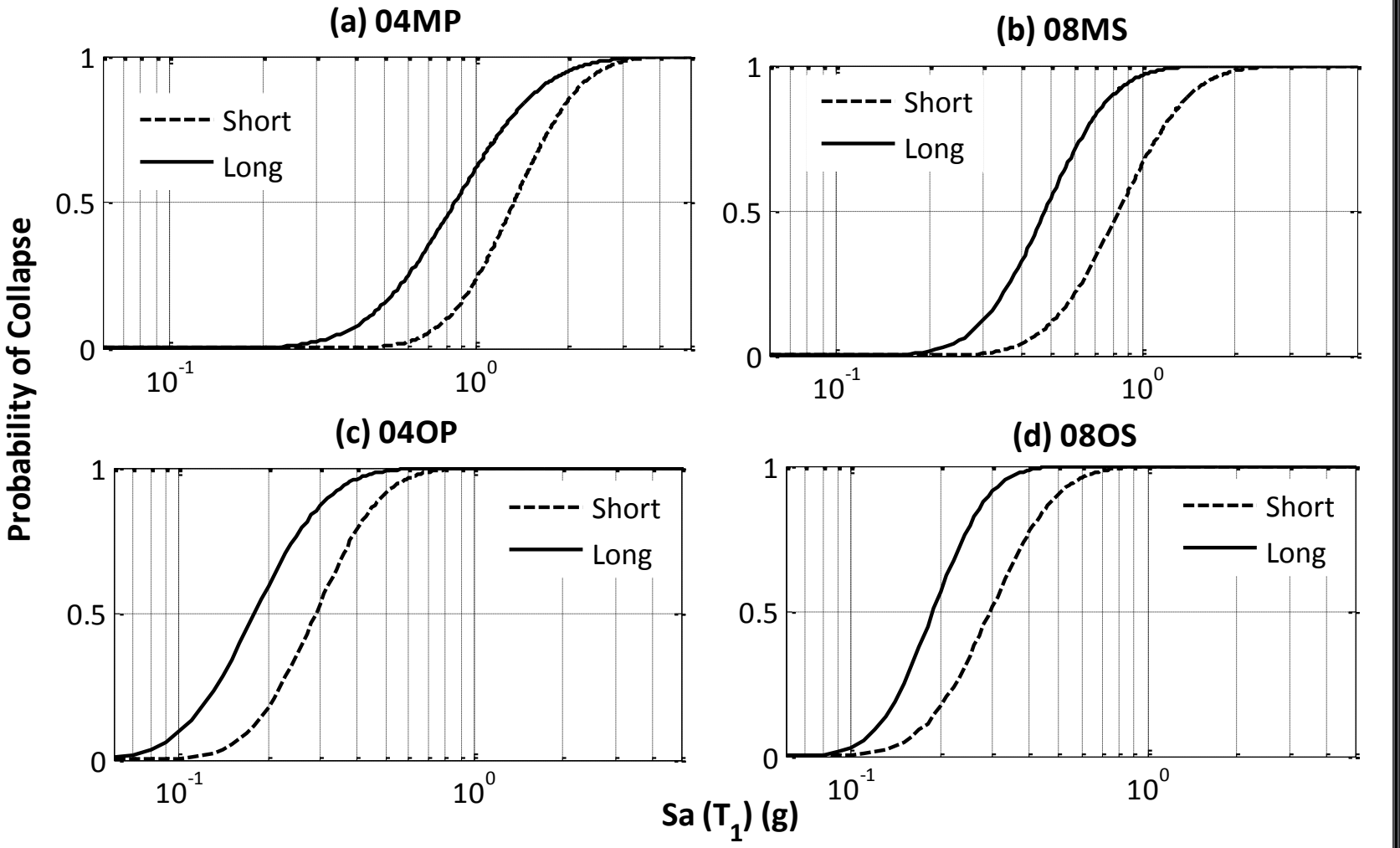




COLLAPSE FRAGILITY CURVES



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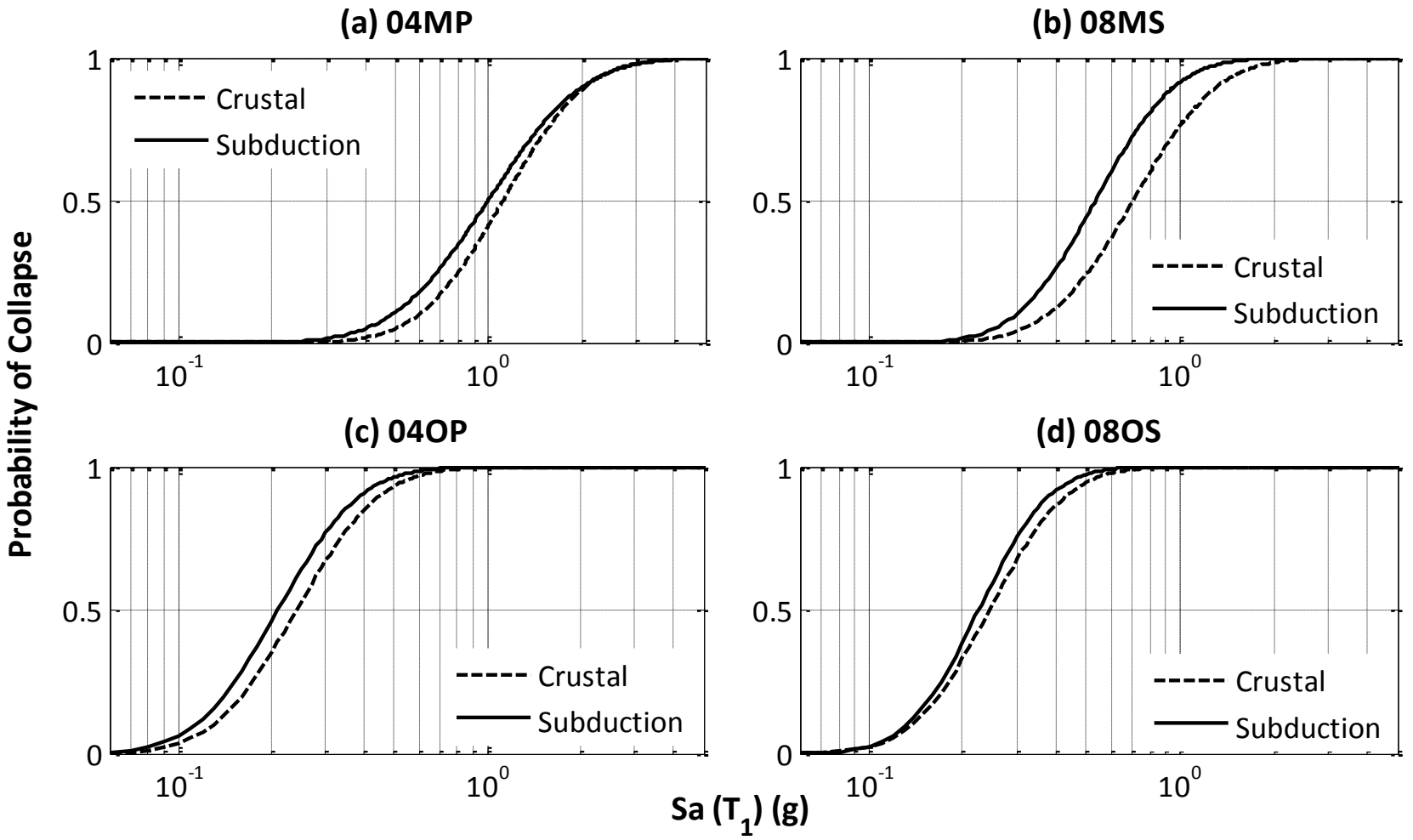

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QUESTIONS?

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