Review of Hazard Feedback for path effects & TI team approach

N. Abrahamson

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Case 3: Duration

- Base: 1/fa + 0.05 R
- Case 3.1: 1/fa + b R

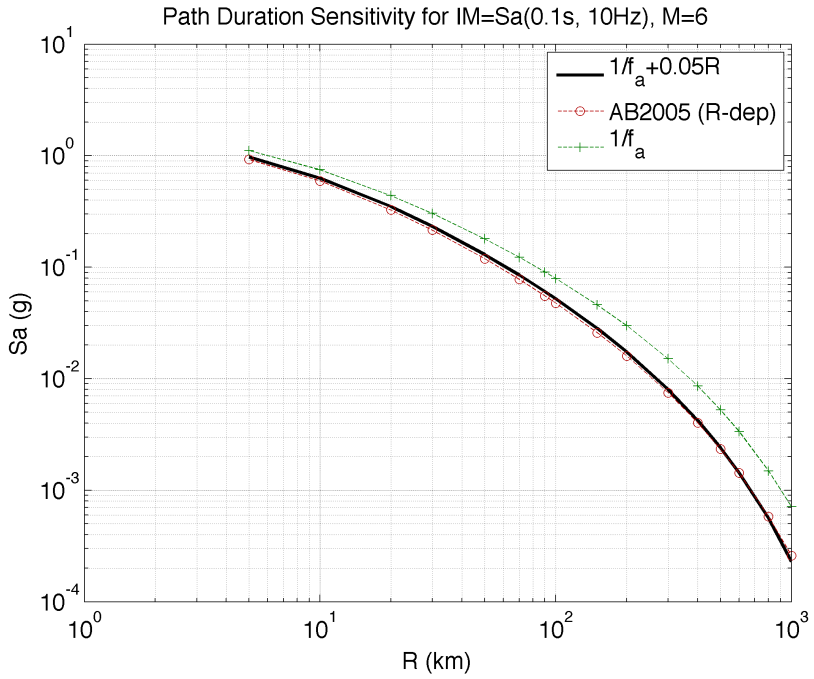
  b=0 for R< 10 km

  b=0.16 for 10<R<70 km

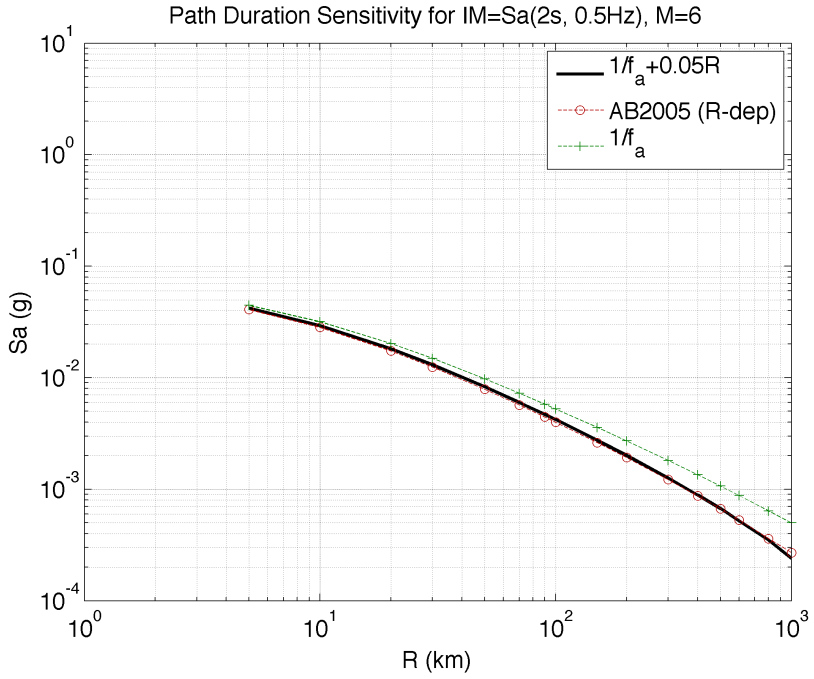
  b=-0.03 for 70<R<130 km

  b = 0.04 for 130km < R
- Case 3.2: 1/fa

Duration – 10 Hz



Duration – 0.5 Hz



Gemetrical Spreading and Q

1. Linear from Atkinson and Mereu (1992) (Case 0)
   GS= R^{-1} for all distances
   $Q = 2000$
2. Bilinear from Boatwright and Seekins (2011)

$$GS = \begin{cases} R^{-1} & R < 50\ km \\ R^{-0.5} & R > 50\ km \end{cases}$$
$$Q = 410 f^{0.5} \quad 0.2 < f < 20\ Hz$$

3. Bilinear model 1 based on trilinear from Atkinsons (2004):

$$GS = \begin{cases} R^{-1.3} & R < 100\ km \\ R^{-0.5} & R > 100\ km \end{cases}$$

4. Bilinear model 2 based on trilinear from Atkinsons (2004):

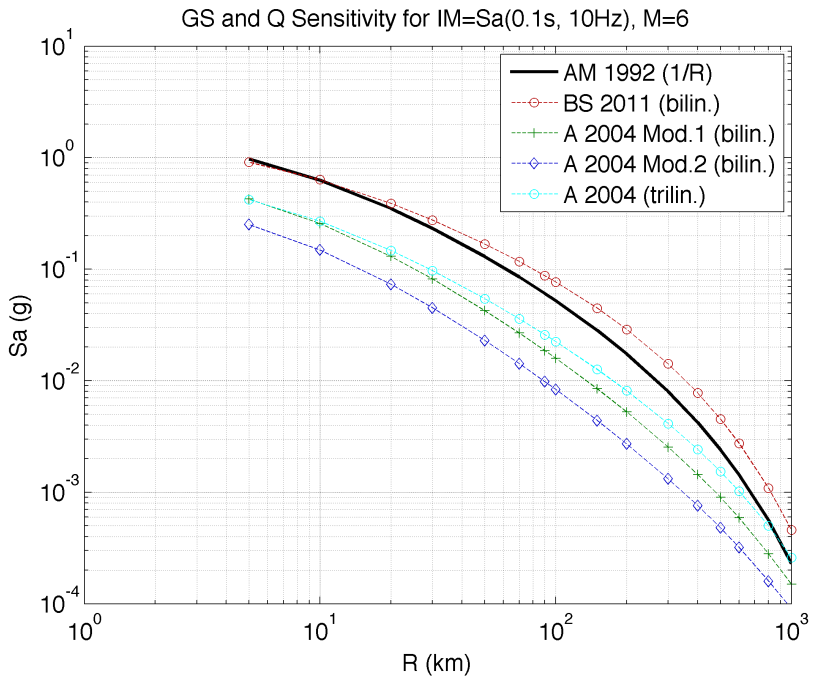
$$GS = \begin{cases} R^{-1.3} & R < 70\ km \\ R^{-0.5} & R > 70\ km \end{cases}$$

5. Trilinear from Atkinson (2004)

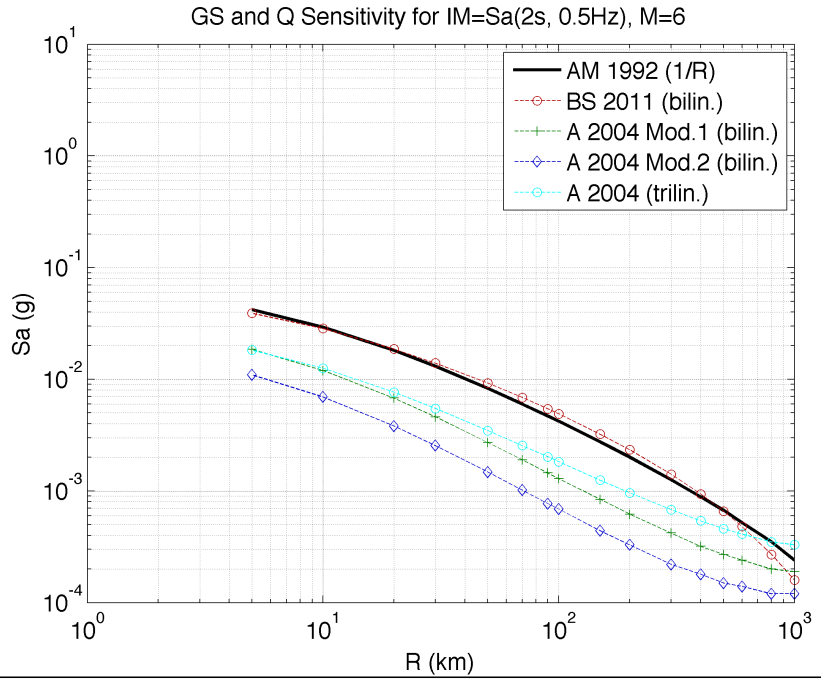
$$GS = \begin{cases} R^{-1.3} & R < 70\ km \\ R^{0.2} & 70 \le R < 100\ km \\ R^{-0.5} & R \ge 100\ km \end{cases}$$

Q for all three Atkinson (2004) variations (3-5):
$\log(Q) = 3.052 - 0.393 \log(f) + 0.945 \log(f)^2 - 00.327 \log(f)^3 \quad 0.2 < f < 20$
Use simplification from Dave Boore (see attached)

Geometrical Spreading & Q – 10 Hz



Geometrical Spreading & Q – 0.5 Hz



6. Effective Distance (Fictitious depth)

- Base: Atkinson & Silva (2000)

  log (h) = -0.05 + 0.15M

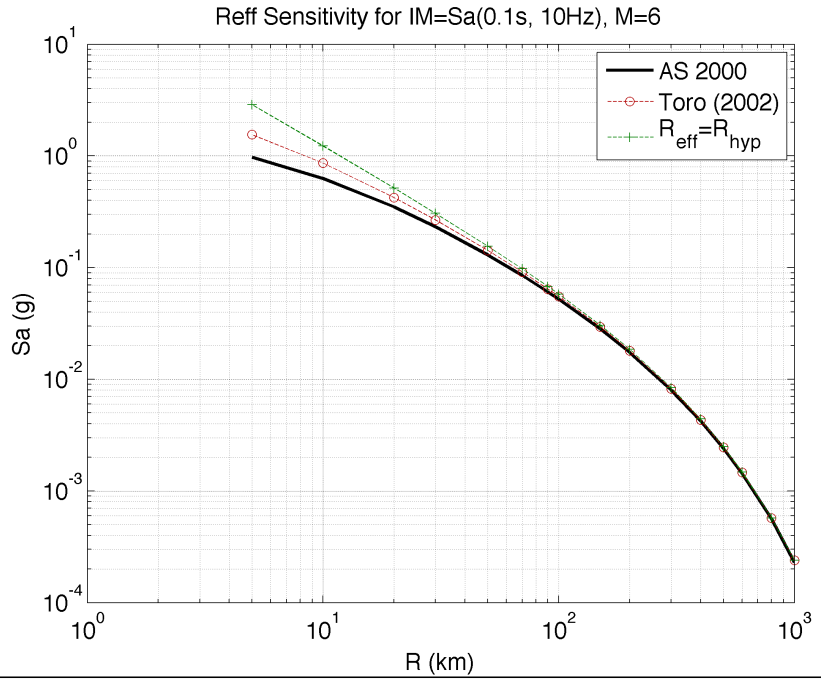
- Case 6.1:Toro (2002)

  log(h) = -1.0506 + 0.26M (toro

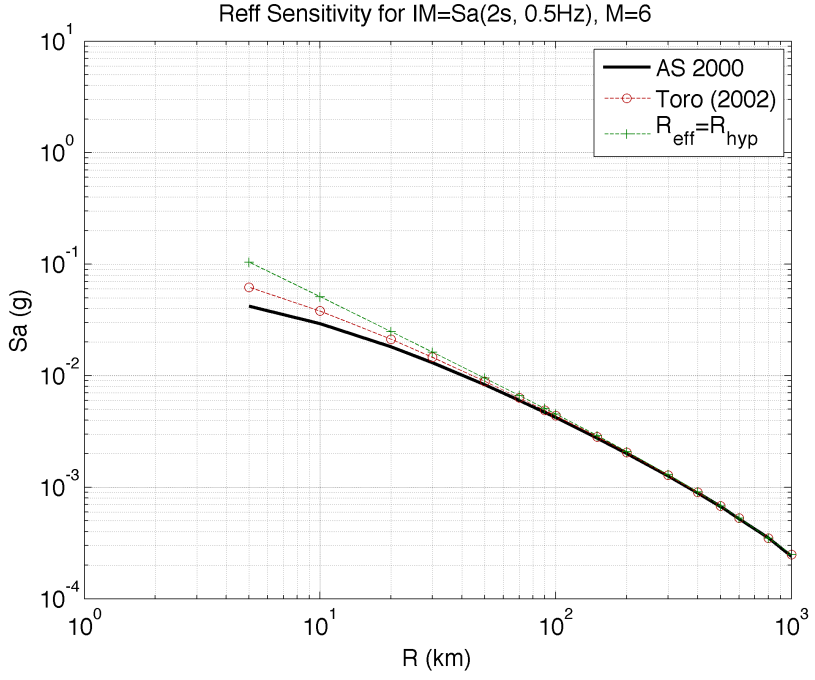
- Case 6.2: Reff = Rrup

  h = 0

Effective Distance – 10 Hz

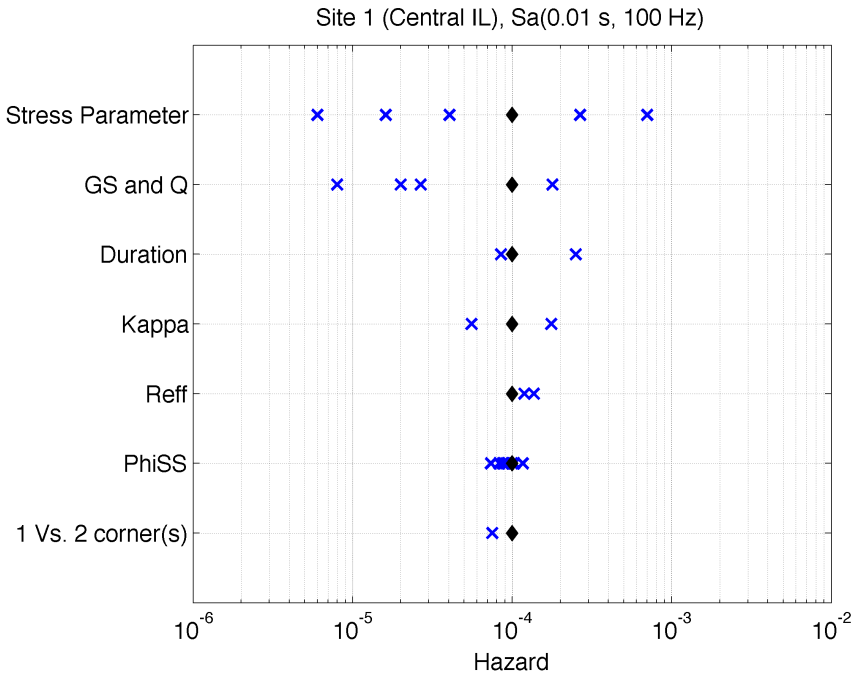


Effective Distance – 0.5 Hz

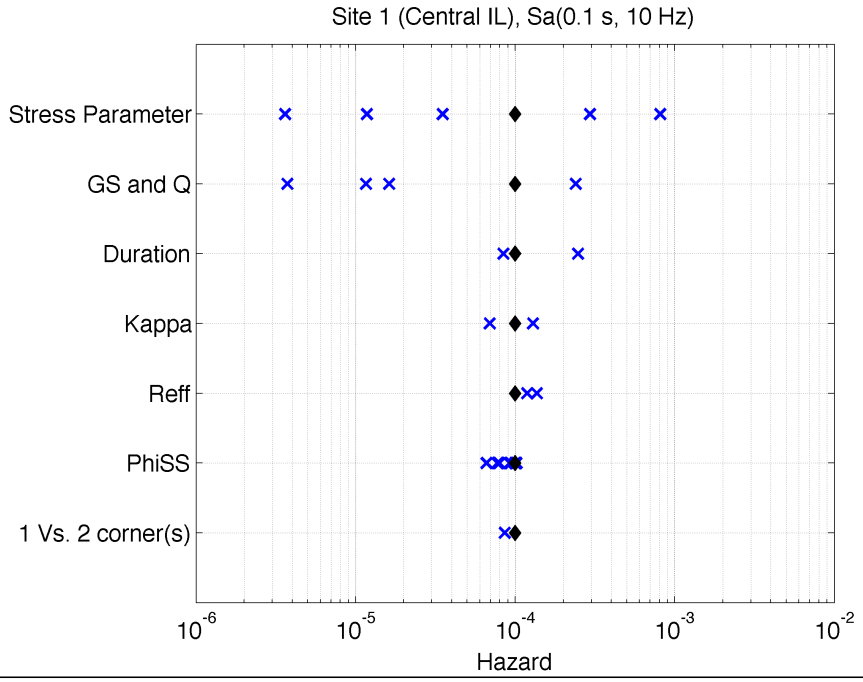


Test Sites (from SSC Study)

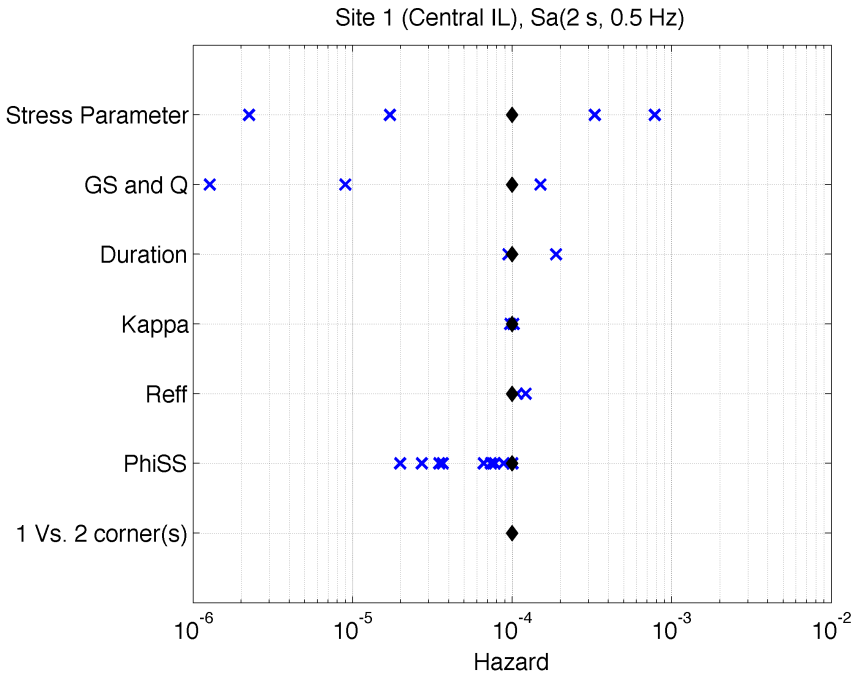
Site 1 – 100 Hz (1E-4)



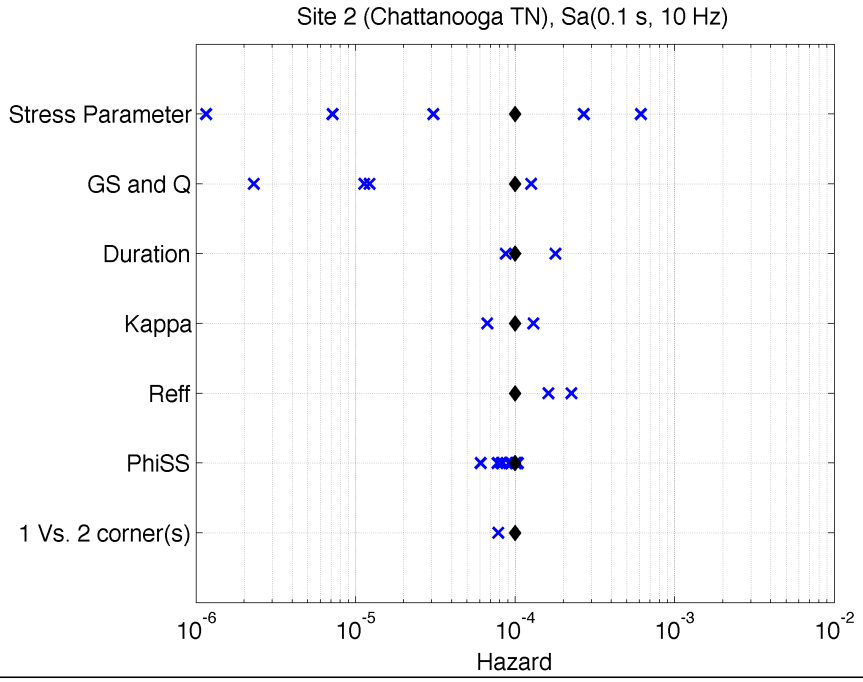
Site 1 – 10 Hz (1E-4)



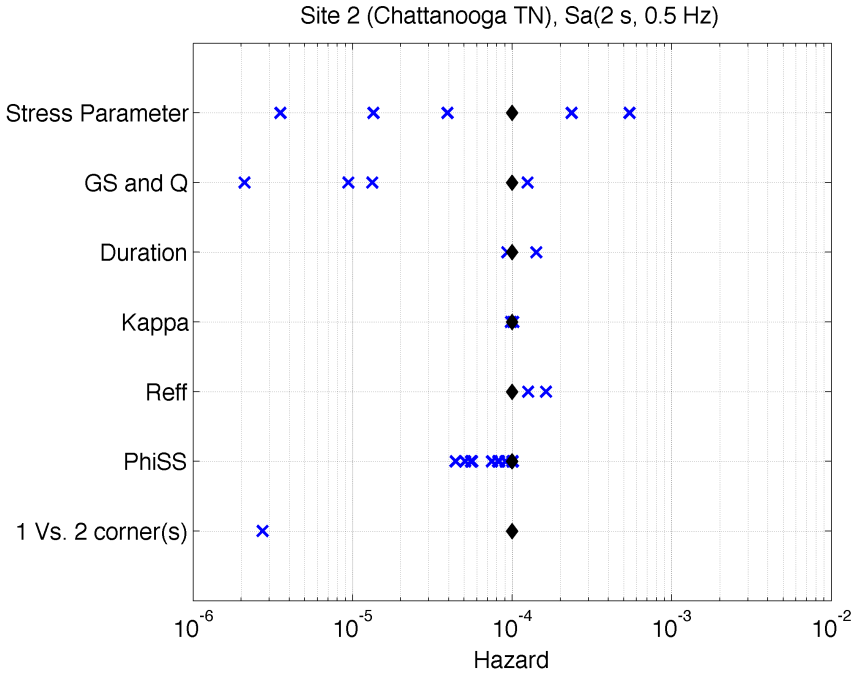
Site 1 – 0.5 Hz (1E-4)



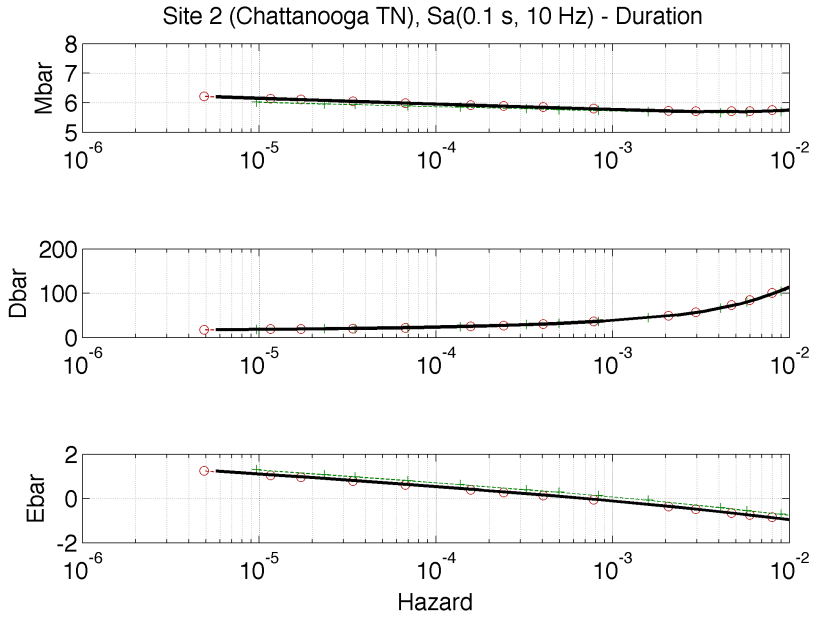
Site 2 – 10 Hz (1E-4)



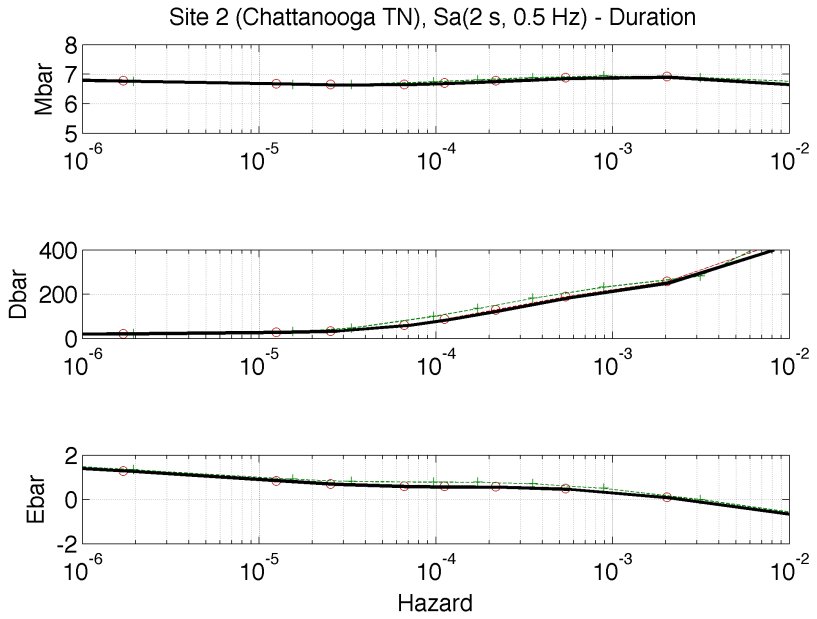
Site 2 – 0.5 Hz (1E-4)



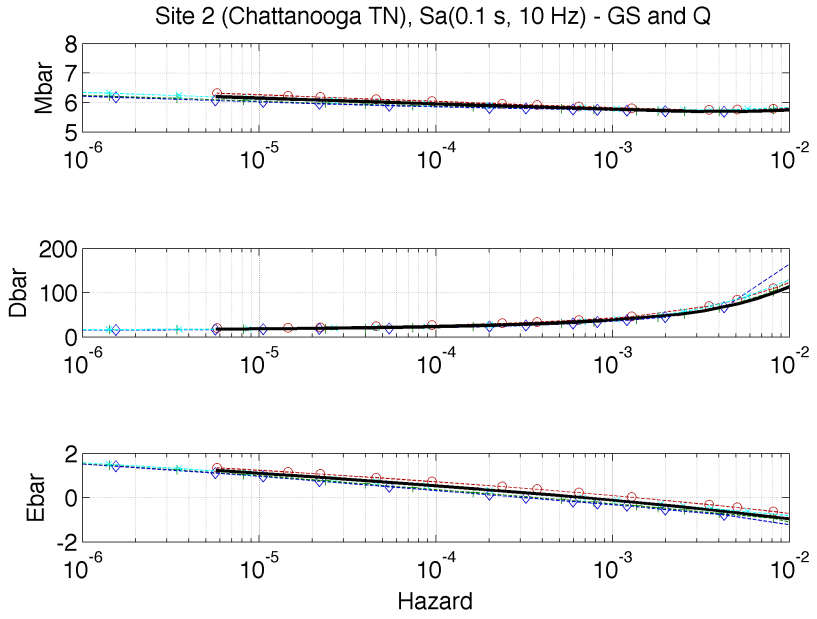
Site2: Case 3 – 10 Hz



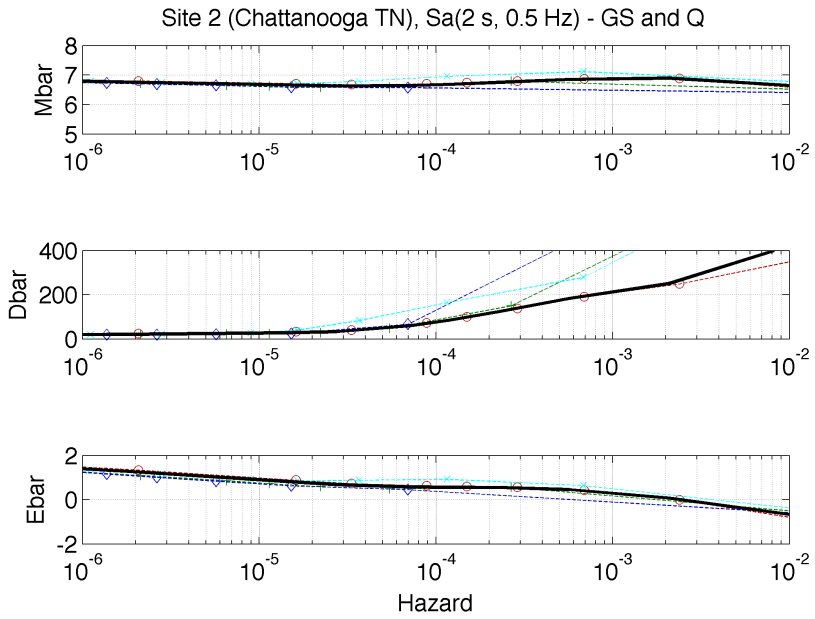
Site2: Case 3 – 0.5 Hz



Site2, Case 5 – 10 Hz



Site 2: Case 5 – 0.5 Hz



TI team Approach to Regionalization

- Evaluate effects of differences in regionalization on hazard for sample sites (Box C4)
  - Keep number of regions small to keep PSHA applications manageable, but capture large differences
    - Will need rules for paths crossing regions (source & site in different regions)
- Evaluate effects of regional differences in stress-parameters on hazard for sample sites (part of Box D2)
- For regional differences that are not modeled explicitly, consider increasing sigma if needed to cover regional changes.