

# Comparison of GMPEs Developed Using the Hybrid Empirical Method

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# Description of GMPEs

- C03 – Campbell (2003)
  - Four empirical GMPEs
    - Abrahamson & Silva (1997)
    - Campbell (1997)
    - Sadigh et al. (1997)
    - Campbell & Bozorgnia (2003)
  - Seismological models
    - WNA: Atkinson & Silva (2000), SCPS-100 bars,  $\kappa_0=0.04s$
    - CENA: EPRI (1993), Atkinson & Boore (1998), SCPS-150 bars,  $\kappa_0=0.006s$  (0.003–0.012s)

# Description of GMPEs

- TP05 – Tavakoli & Peshezk (2005)
  - Three empirical GMPEs
    - Abrahamson & Silva (1997)
    - Campbell (1997)
    - Sadigh et al. (1997)
  - Seismological models
    - WNA: Atkinson & Silva (2000), DCPS
    - CENA: EPRI (1993); Atkinson & Boore (1998), DCPS

# Description of GMPEs

- C07 – Campbell (2007, 2008a, 2011)
  - One empirical GMPE (NGA model)
    - Campbell & Bozorgnia (2008)
  - Seismological models  $\kappa_0=0.04s$ 
    - WNA: Atkinson & Silva (2000), SCPS-100 bars,  $\kappa_0=0.04s$
    - CENA: Atkinson & Boore (2006), SCPS-280 bars,  $\kappa_0=0.005s$

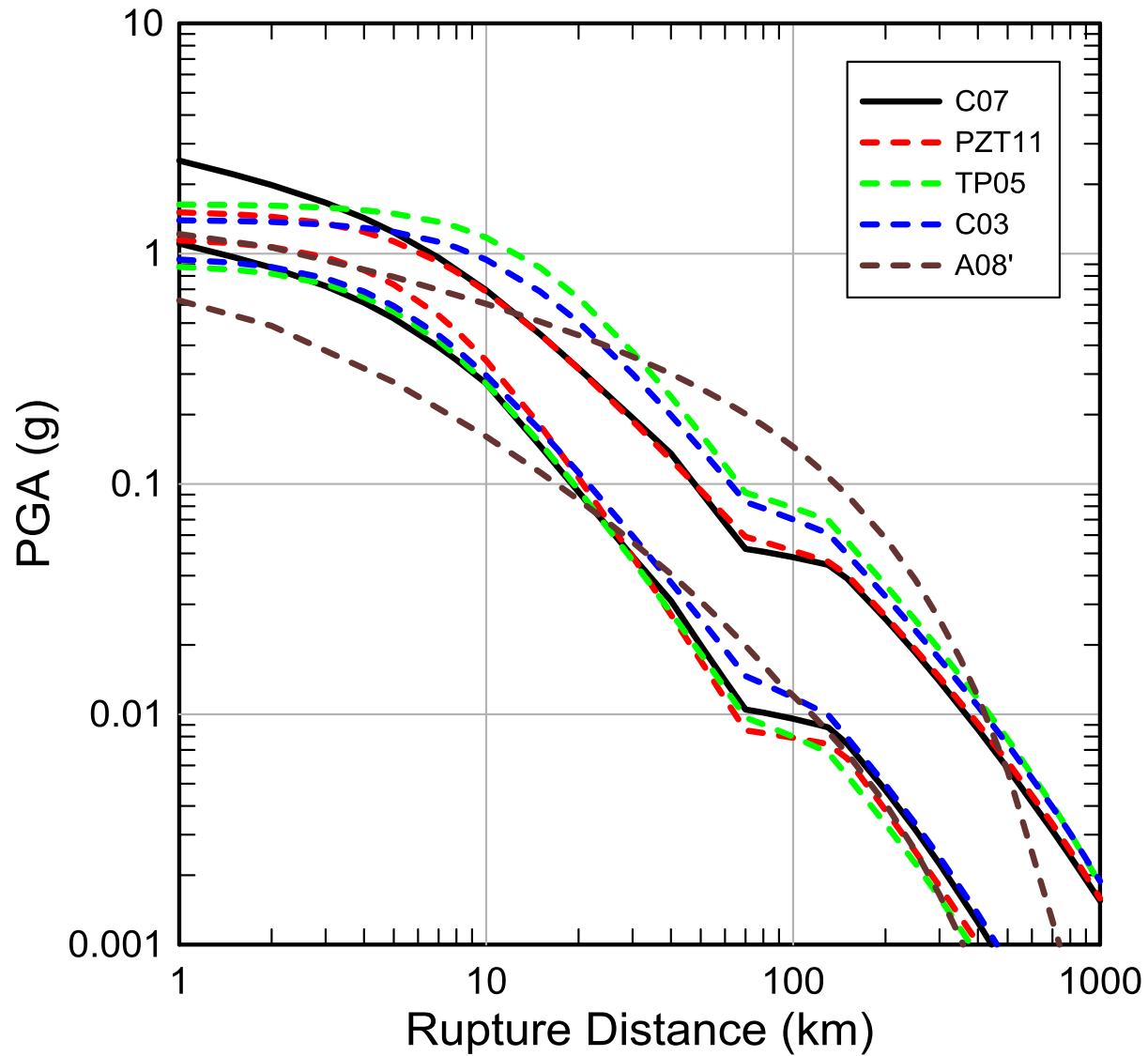
# Description of GMPEs

- PZT11 – Pezeshk et al. (2011)
  - Five empirical GMPEs (NGA models)
    - Abrahamson & Silva (2008)
    - Boore & Atkinson (2008)
    - Campbell & Bozorgnia (2008)
    - Chiou & Youngs (2008)
    - Idriss (2008)
  - Seismological models
    - WNA: Atkinson & Silva (2000), SCPS-80 bars,  $\kappa_0=0.04s$
    - CENA: Atkinson & Boore (2006), SCPS-250 bars,  $\kappa_0=0.005s$ ,  
 $R'_{rup}$

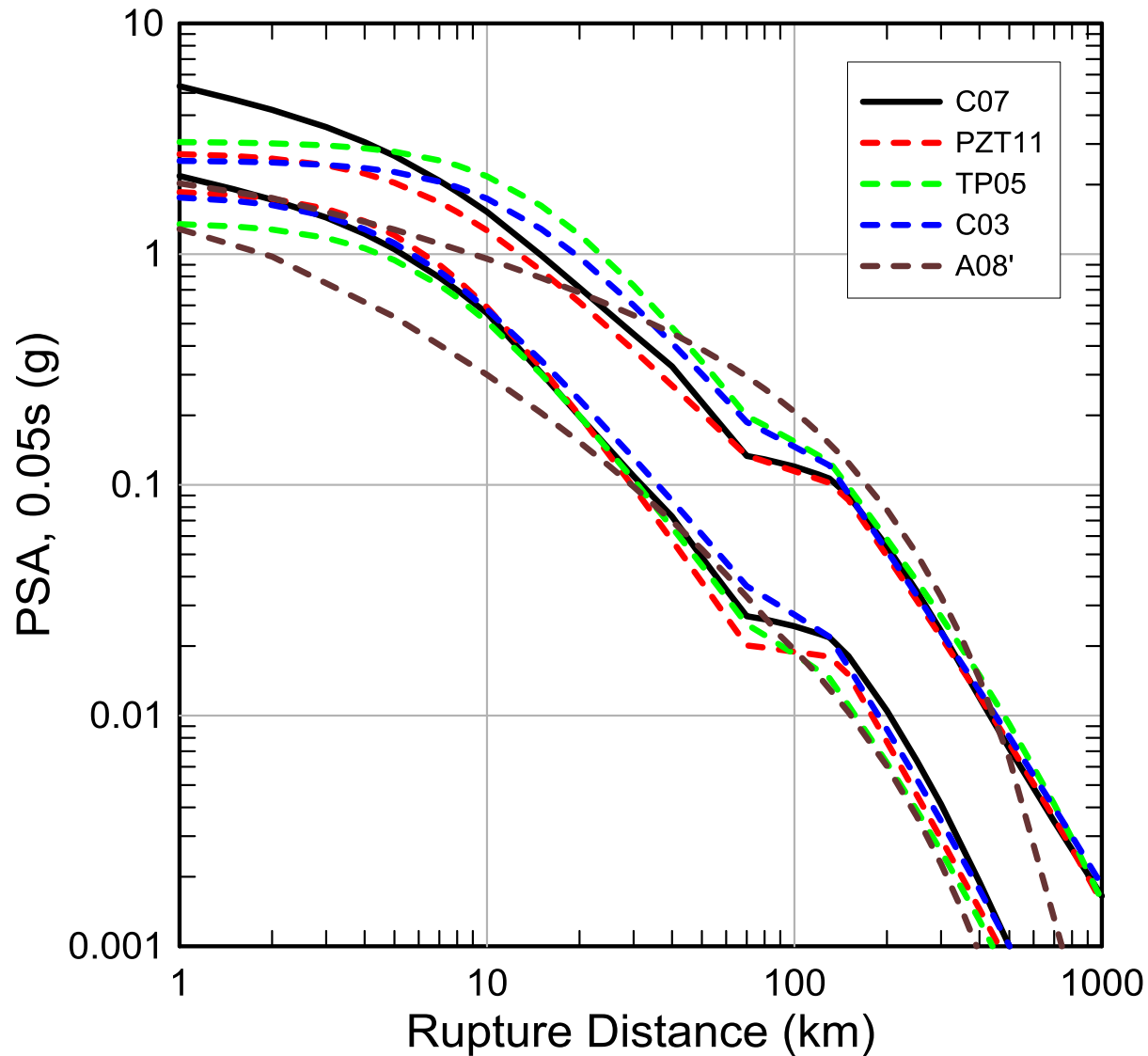
# Description of GMPEs

- A08' – Atkinson (2008), Atkinson & Boore (2011)
  - One empirical GMPE (NGA model)
    - Boore & Atkinson (2008) – adj. for small-magnitude bias  
by Atkinson & Boore (2011)
  - Seismological models
    - WNA: None – uses predictions from empirical GMPE
    - CENA: None – uses recordings to adjust WNA GMPE

# PGA; M=5.0, 7.0; Hard Rock

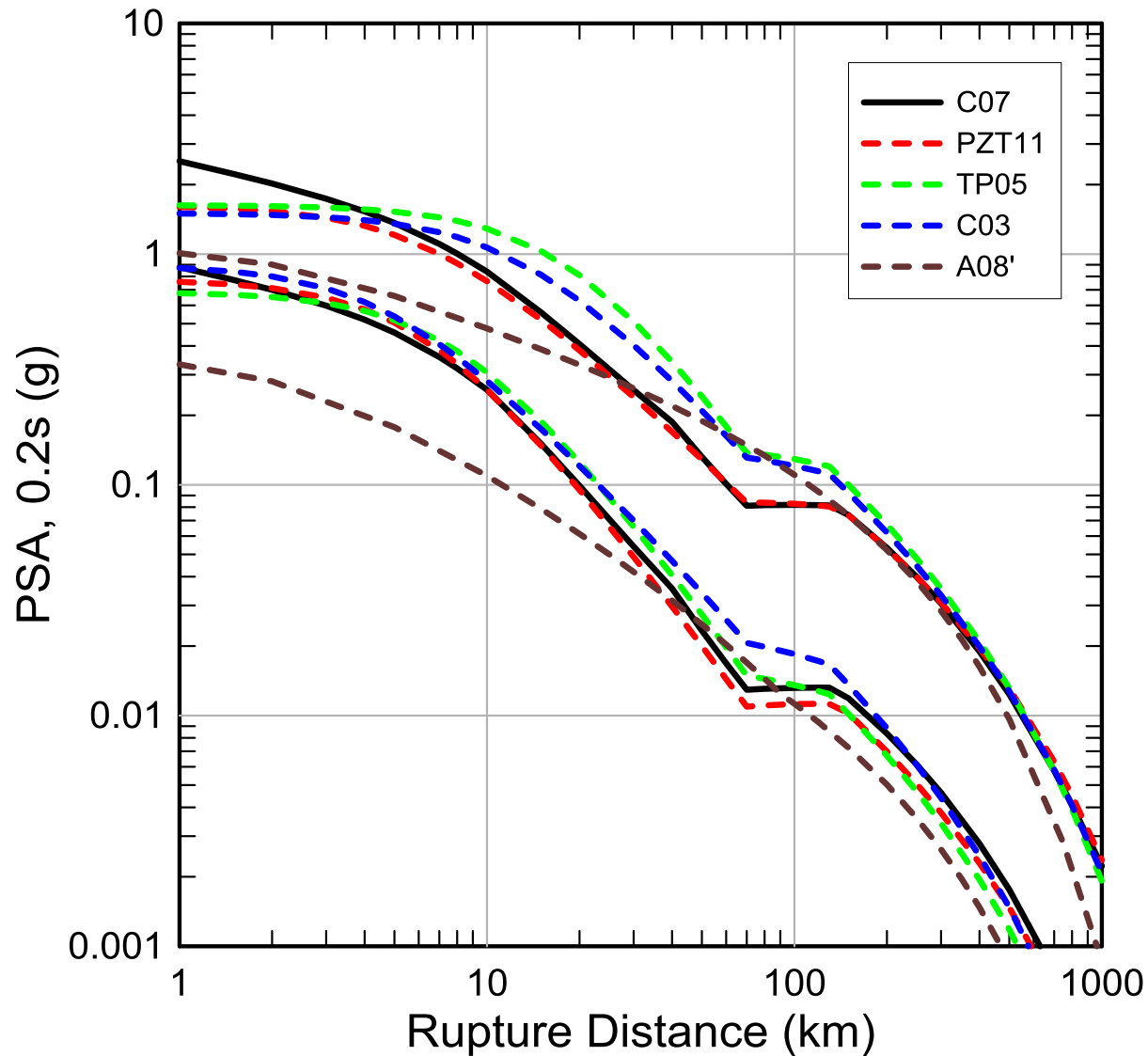


# PSA (0.05s, 20 Hz); M=5.0, 7.0; Hard Rock





# PSA (0.2s, 5 Hz); M=5.0, 7.0; Hard Rock



# PSA (1.0s, 1 Hz); M=5.0, 7.0; Hard Rock

