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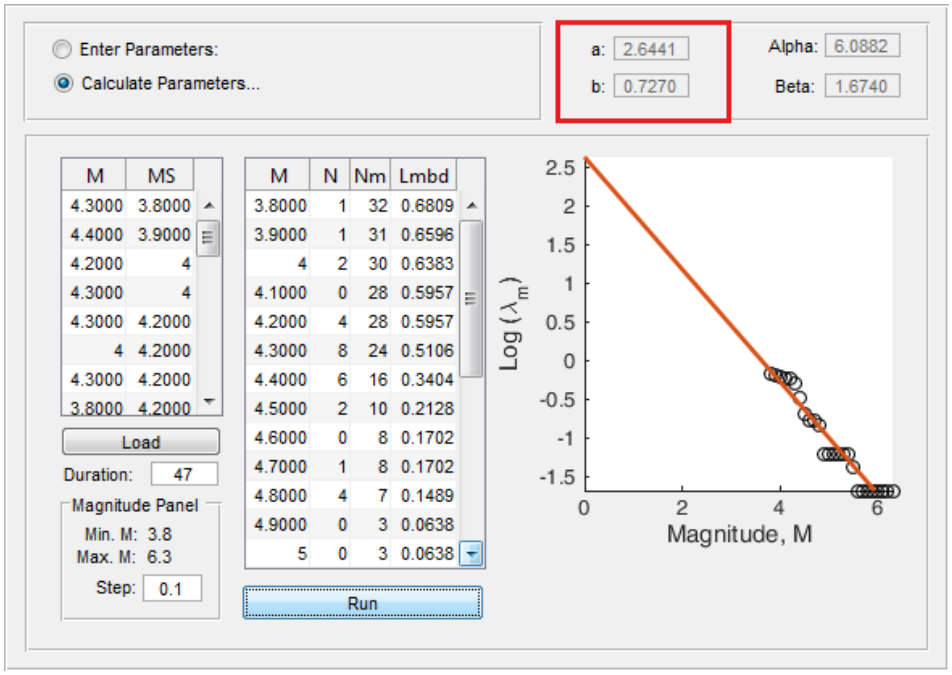
Verification Examples (C4)

PSHA Tool: Hazard Calculations

Example 1 – Gutenberg-Richter b-Value

A comparison between the independent calculations and SG results.

Year	M	Year	M
2004	4.3	2002	4.4
2004	4.4	2002	4.8
2004	4.2	1998	4.3
2004	4.3	1998	4.5
2004	4.3	1998	4.2
2004	4	1998	4.8
2004	4.3	1996	4
2004	3.8	1995	4.2
2004	4.2	1993	4.3
2004	4.7	1993	4.4
2004	3.9	1985	4.3
2004	4.4	1983	4.3
2004	4.5	1983	4.8
2004	4.4	1973	4.8
2004	4.4	1959	5.4
2004	6.3	1957	5.5



$$\begin{cases} 26a - 131.30b = -26.707 \\ 131.3a - 677.69b = -145.504 \end{cases} \rightarrow \begin{cases} b = 0.727 \\ a = 2.644 \end{cases}$$

(See *GR TEST.xlsx* file)

Example 2 – PSHA Procedure

A comparison between the independent calculations [1] and SG results.

Example 4.5

The basic procedures of a typical PSHA can be illustrated for the site shown in Figure 4-6 if the recurrence relationships for each of the source zones is known. Assuming that the seismicity of the respective source zones are described by

Source zone 1: $\log \lambda_m = 4.4 - 1.0M$

Source zone 2: $\log \lambda_m = 3.5 - 0.8M$

Source zone 3: $\log \lambda_m = 2.7 - 1.2M$

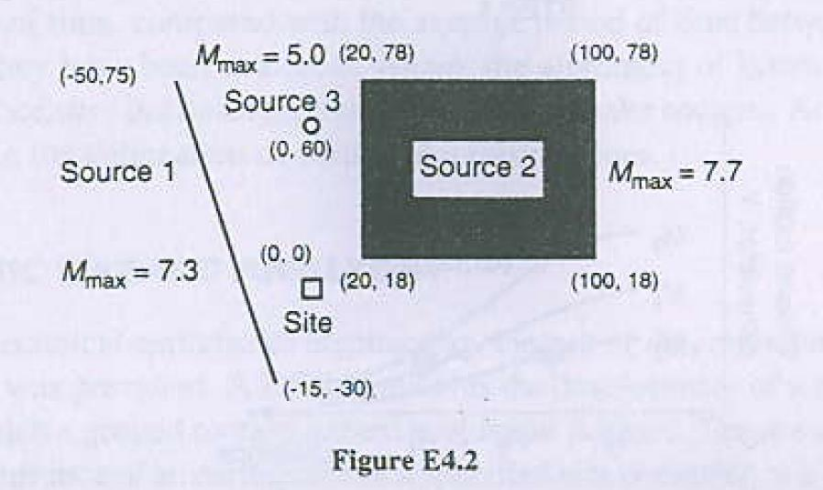
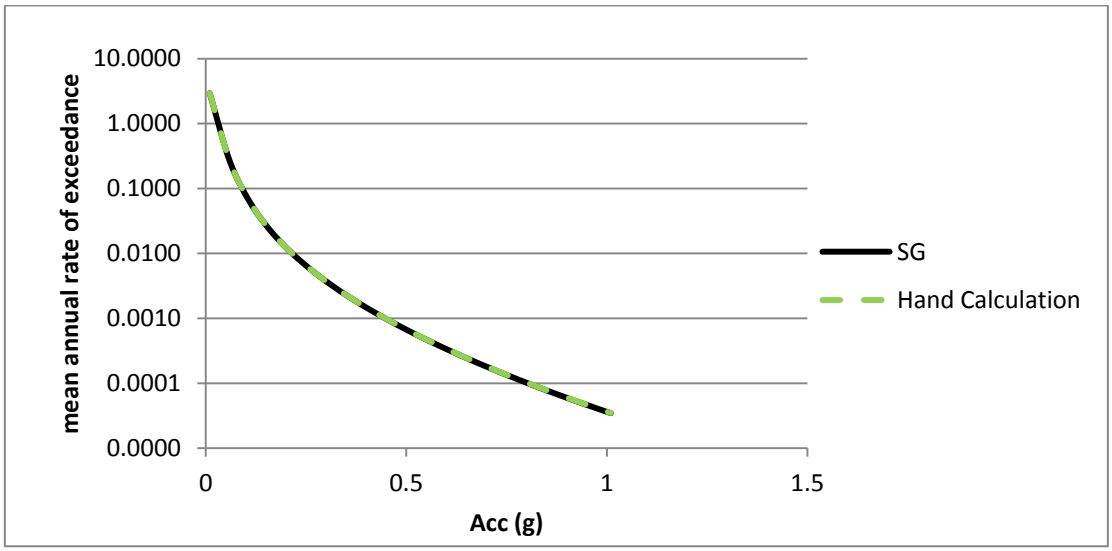


Figure E4.2

Example 4.5 from the reference [1].



Hazard Curve (See *PSHA TEST.xlsx* file)

REFERENCES

[1] Kramer, S.L., 1996. Geotechnical Earthquake Engineering. Prentice-Hall, New Jersey.

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