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A Simple Model of Deformation of an Ancient Tomb Mound Induced by Fault Striking

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The active fault has been attracting attention in archaeology. Especially distribution of active faults in Kinki region is so dense that we can find some areas where ancient tomb mounds are located near active faults. First, this paper presents a historical background of keyhole-shaped tomb mounds handled as target of this paper. Next, we presents a simple model of deformation of a tomb mound, induced by active fault; computer simulation is carried out on a famous example of fault struck tomb mound in southern Osaka, well-known as Mausoleum of the Emperor Nintoku. In our simulation, a long deformation process has been illustrated, which begins with a sudden strike of active fault and, after that, varies gradually in shape in proportion to elapsed time. Comparison between the simulated result and its present shape has also been discussed.

1.

1500 4 6

5000

2.

5 416m

3 1

[1]

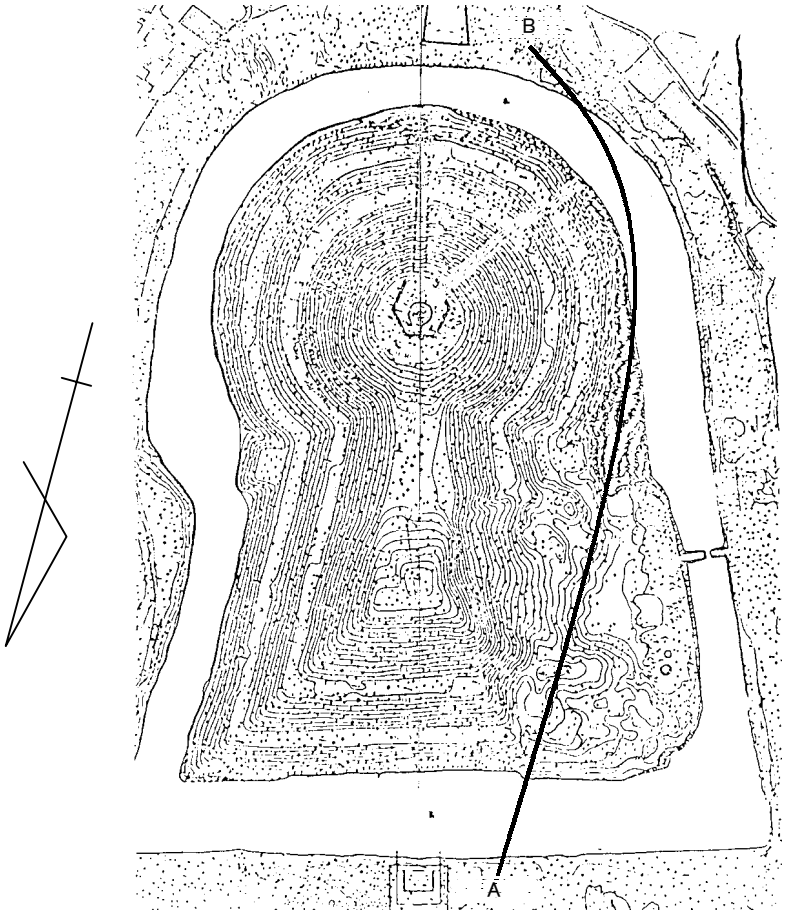

図 1：応神天皇陵と誉田断層

1

15 2

1-A

1.2m 1-B 1.8m

M7.1 23km

1510 9 21

[2]

3.

3.1

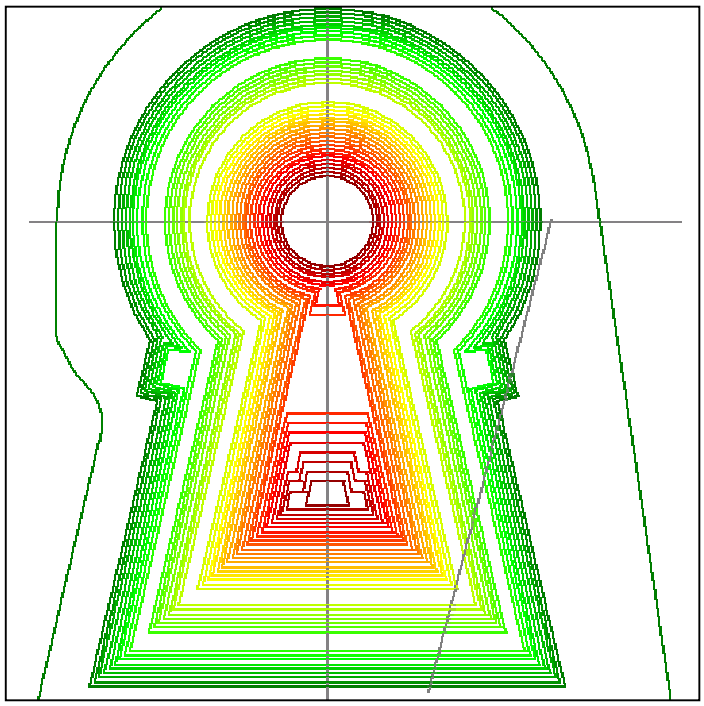

図 2:復元状態の等高線図

1

125 × 185[mm]

1/3000 200dpi

2 1m

512 × 512[pixel]

m

mm CSV

-1000mm 512 × 512

3.2

8 9
9
1 3

L 100%
2L 50% 3L 33% L L
100% L 10pixel
4

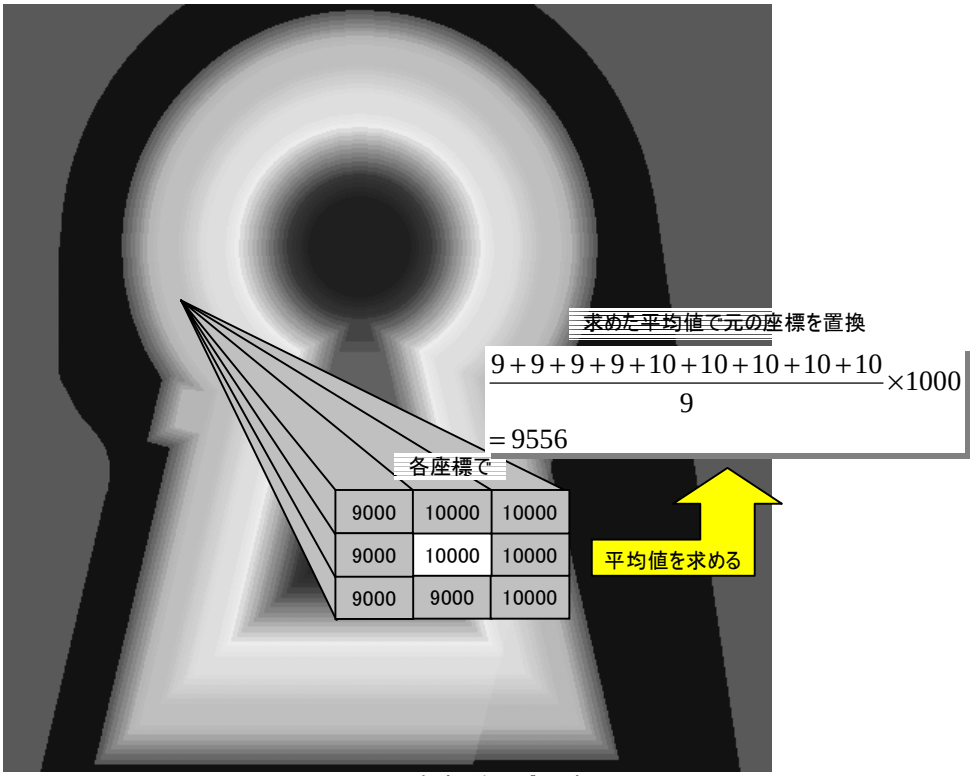

図 3: 崩壊近似モデルの概要

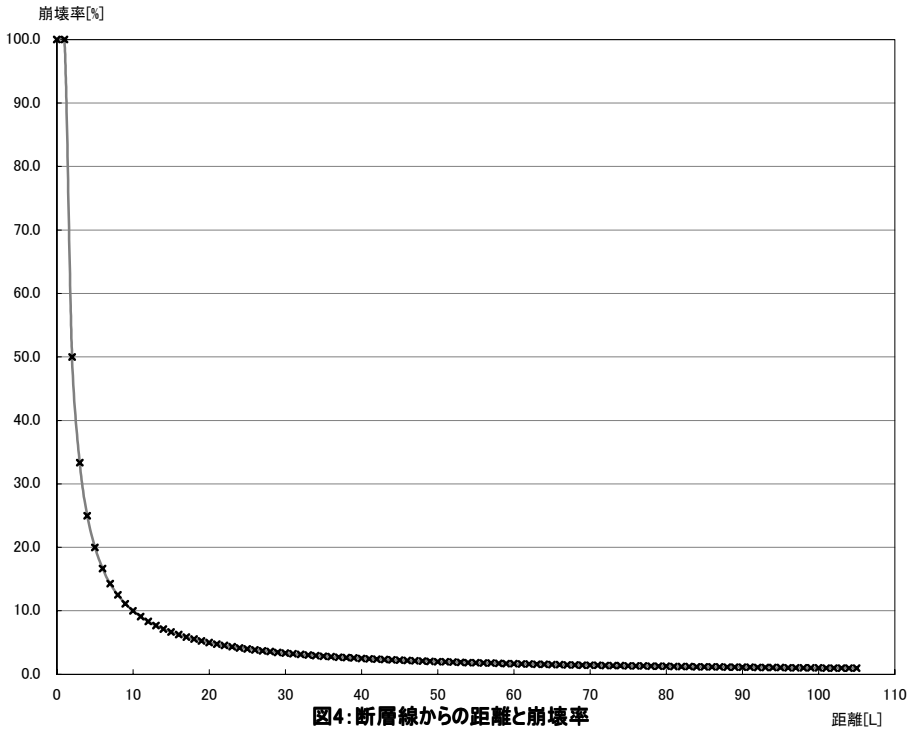

図4：断層線からの距離と崩壊率

3.3

3

-
- 1m
-

500

5 2

6

8m 15m 27m

35m

0m -1m

500

7

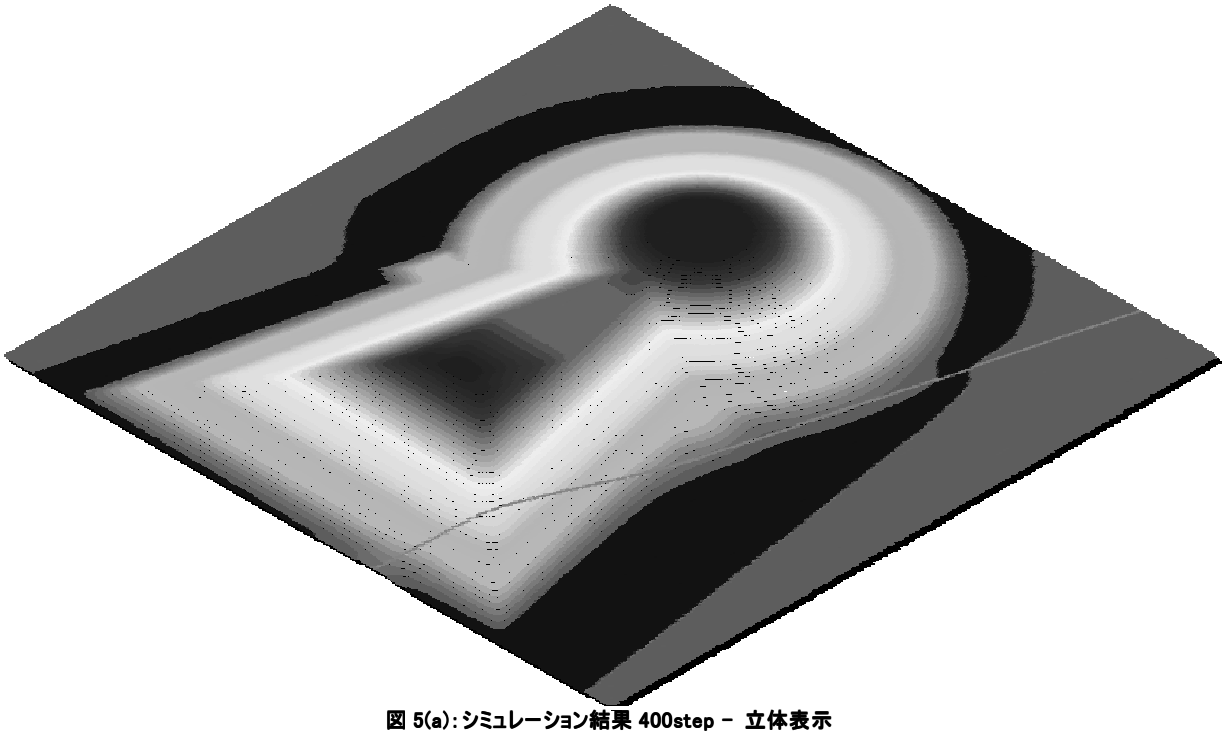

図 5(a):シミュレーション結果 400step - 立体表示

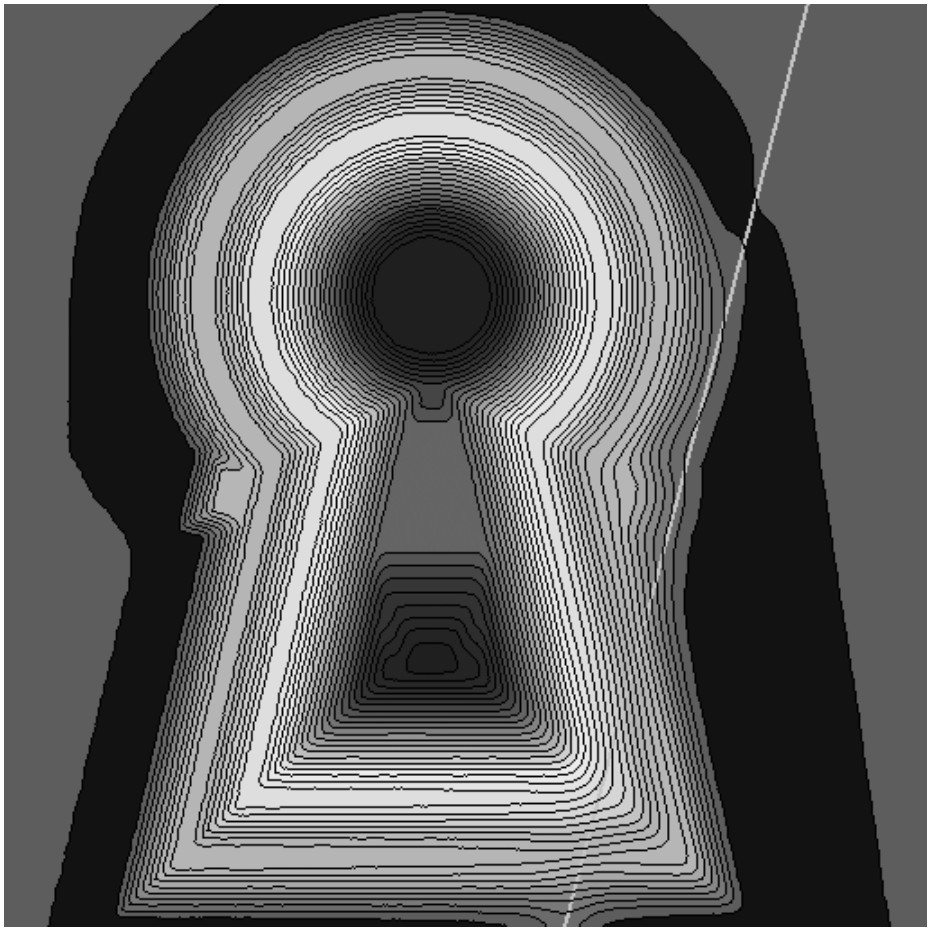

図 5(b):シミュレーション結果 400step - 平面表示

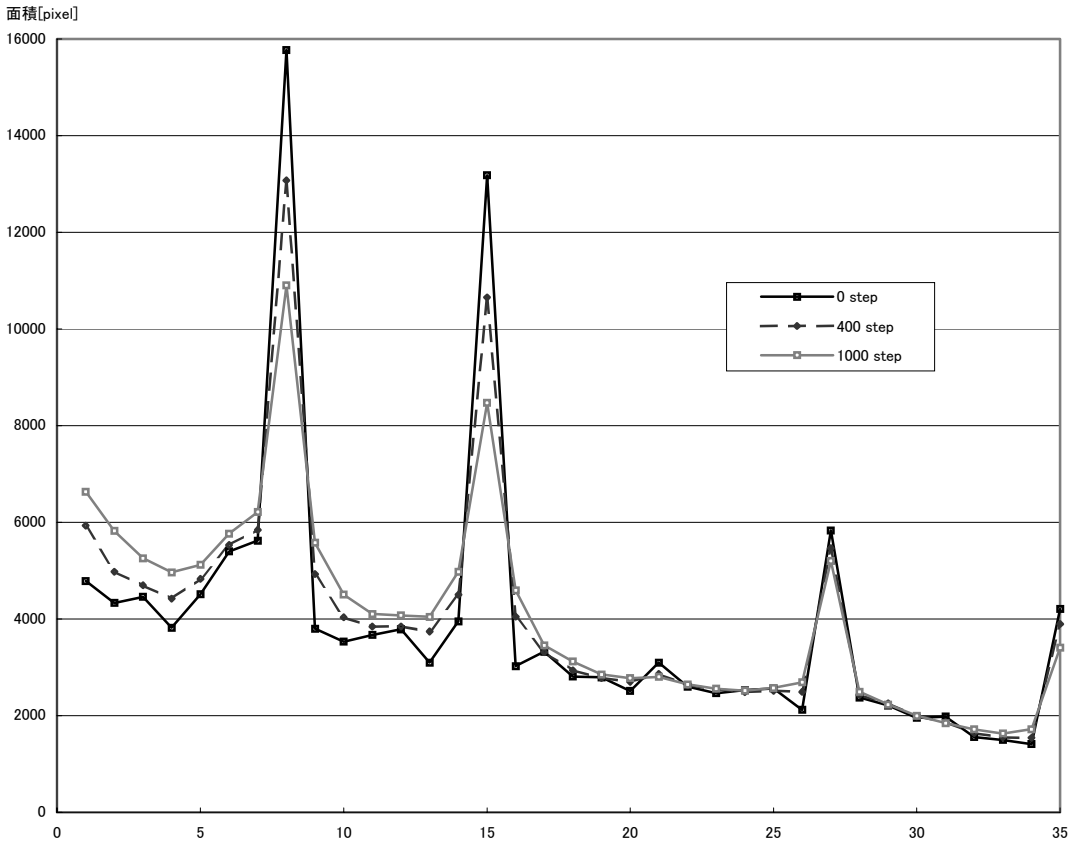

図6：高さと面積の関係

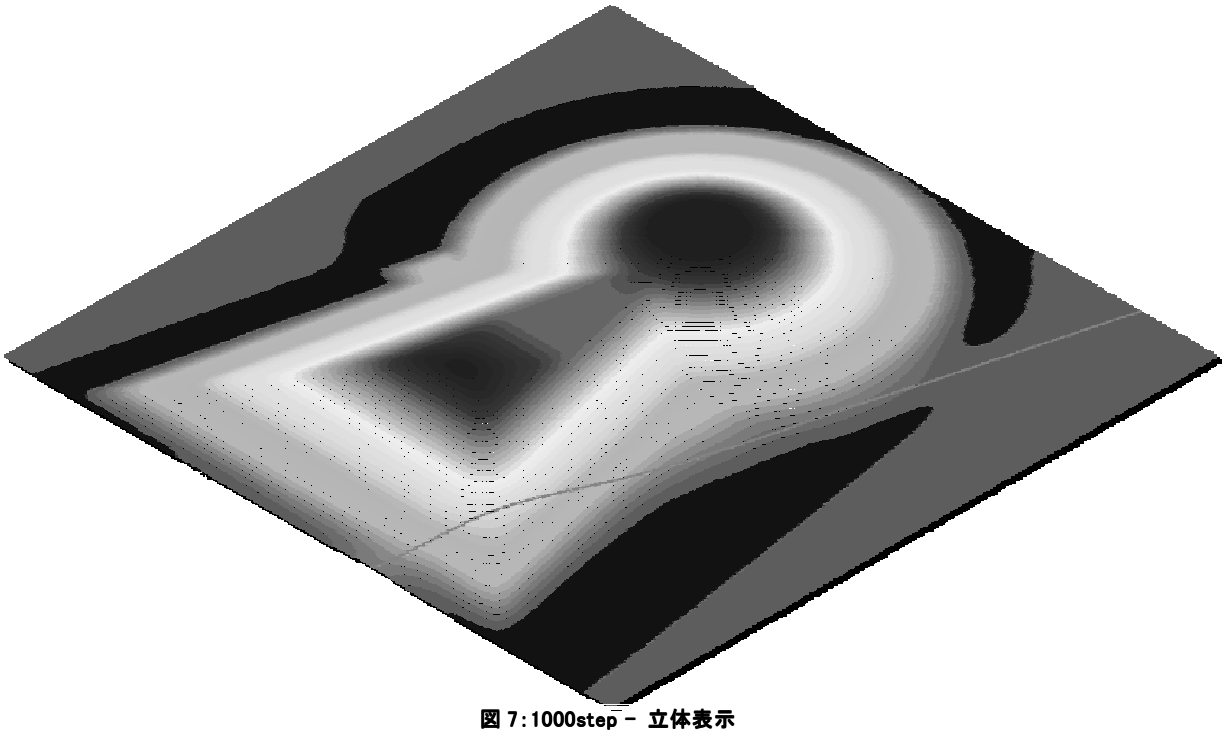

図 7：1000step － 立体表示

4.

[1] 1996
[2] — — 1992
[3]
Digital Active Fault Map of Japan 2002
[4] 2001