Exploring complex normal faulting systems through physics-based dynamic rupture modeling

10-12 min talk!

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ANR EQTIME Project

January 13, 2023

Outline

Motivation

Settings

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Seismic Hazard in Central Italy

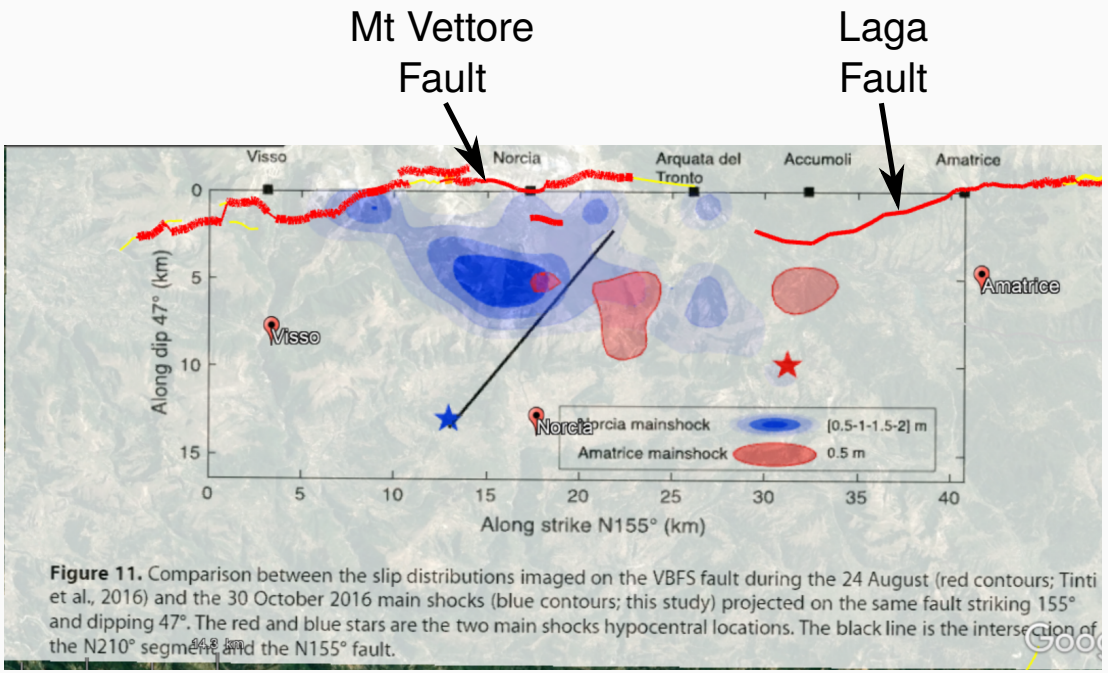

Figure 11. Comparison between the slip distributions imaged on the VBFS fault during the 24 August (red contours; Tinti et al., 2016) and the 30 October 2016 main shocks (blue contours; this study) projected on the same fault striking 155° and dipping 47°. The red and blue stars are the two main shocks hypocentral locations. The black line is the intersection of the N210° segment and the N155° fault.

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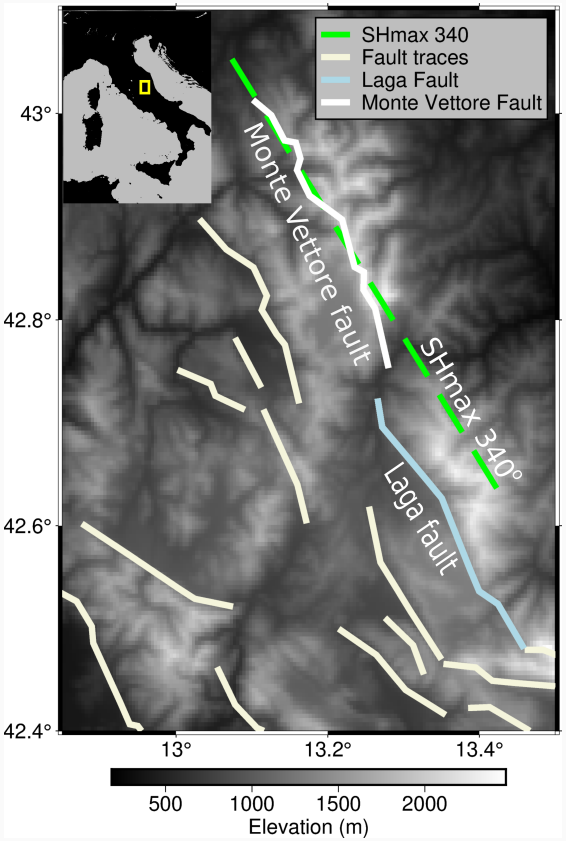

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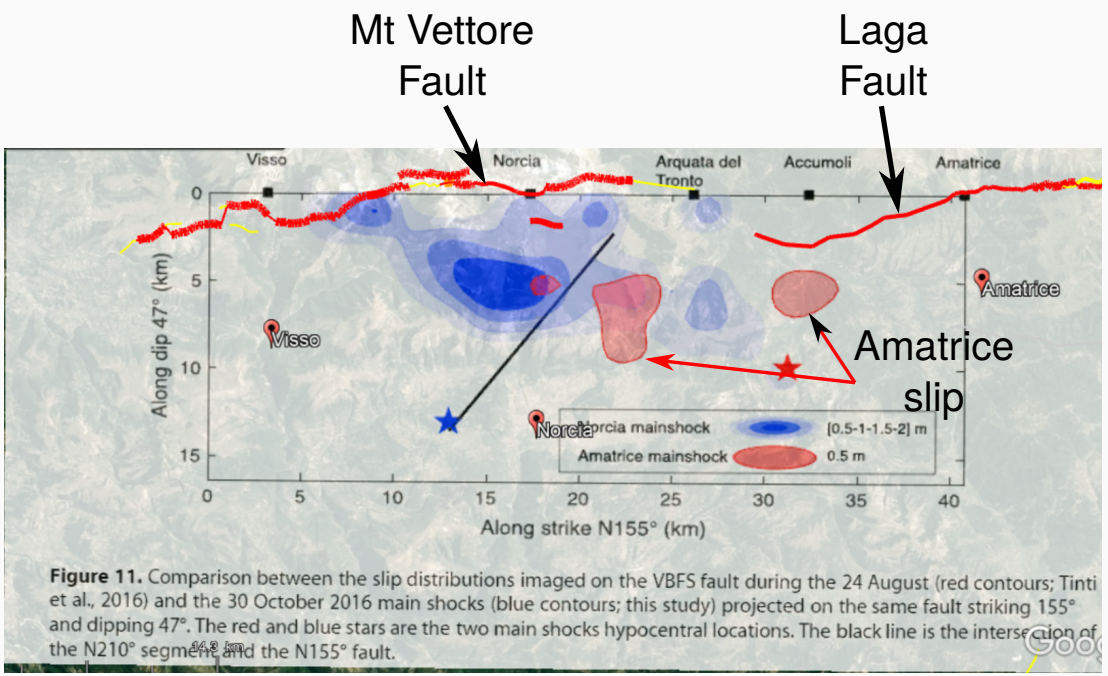

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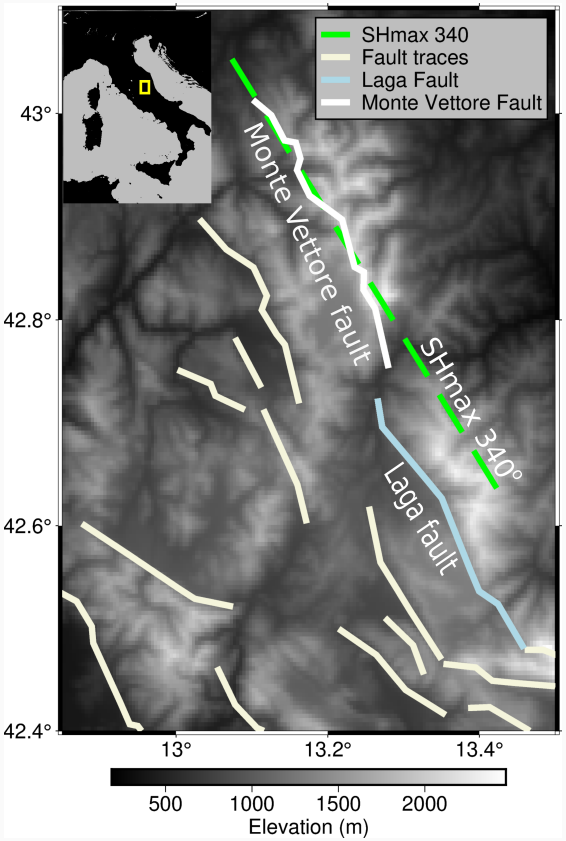

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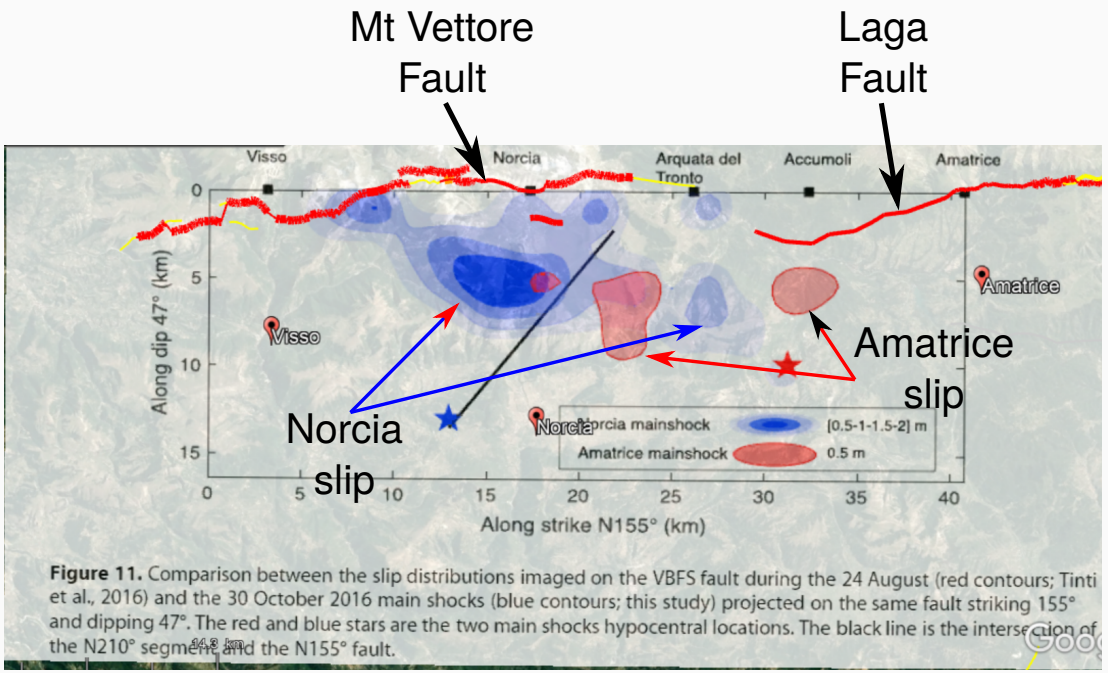

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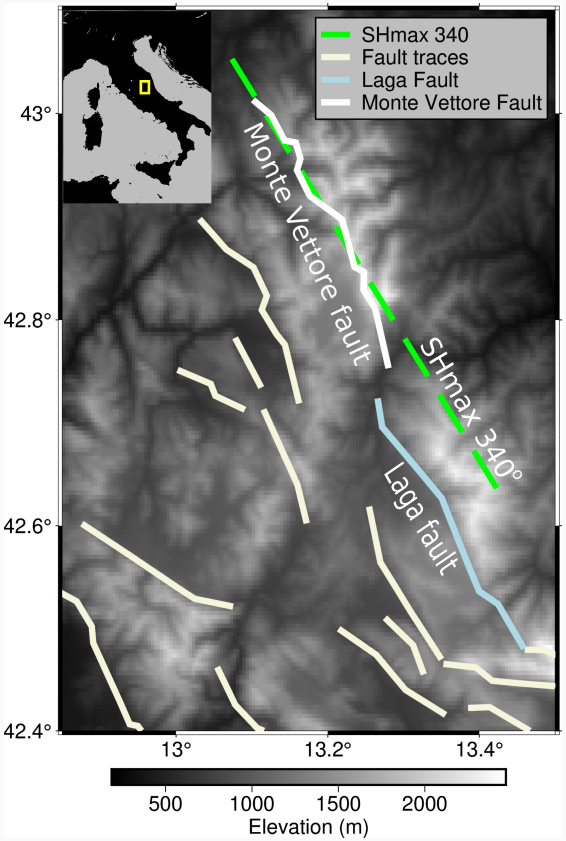

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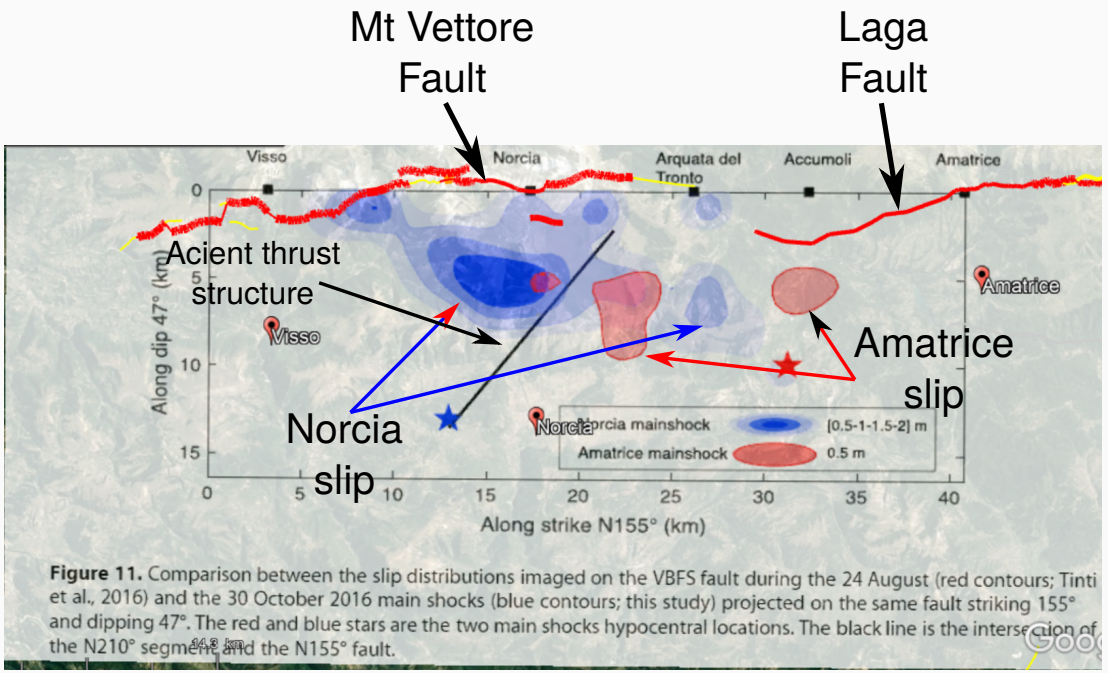

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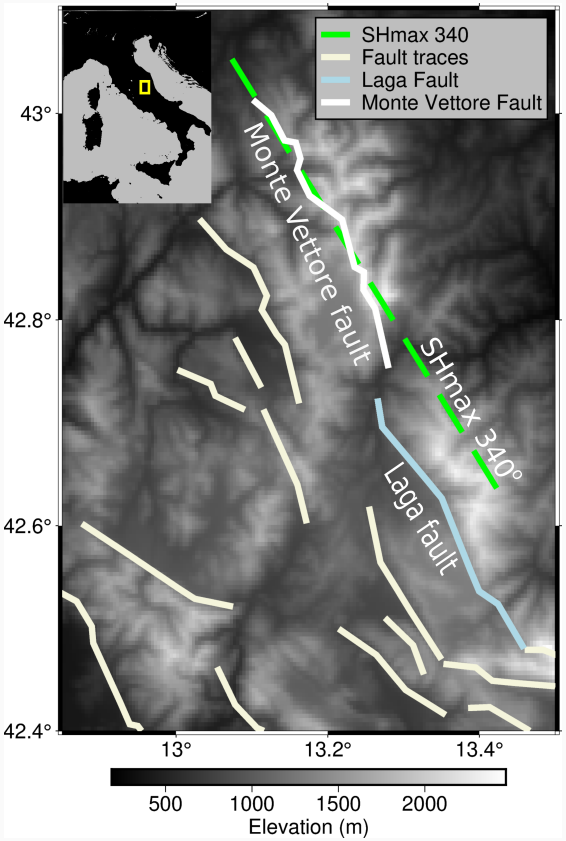

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Rupture jumps across step-overs

Previous studies focused on strike-slip fault systems: Galis et al. (2015); Hu et al. (2016); Bai and Ampuero (2017); Li and Liu (2020); Oglesby (2008), and more ...

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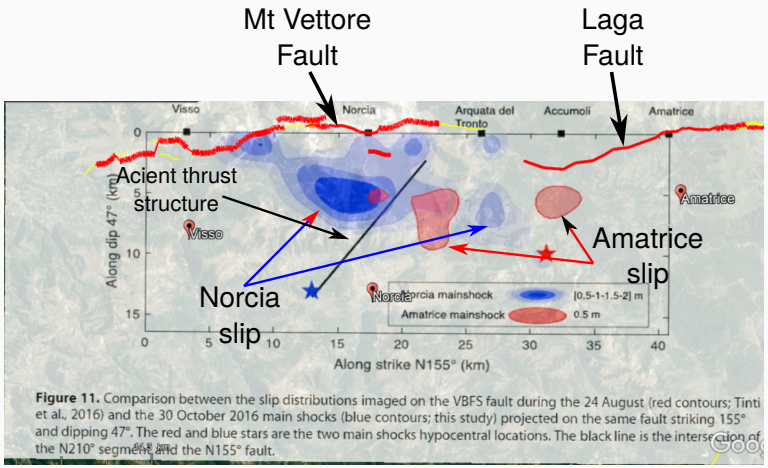

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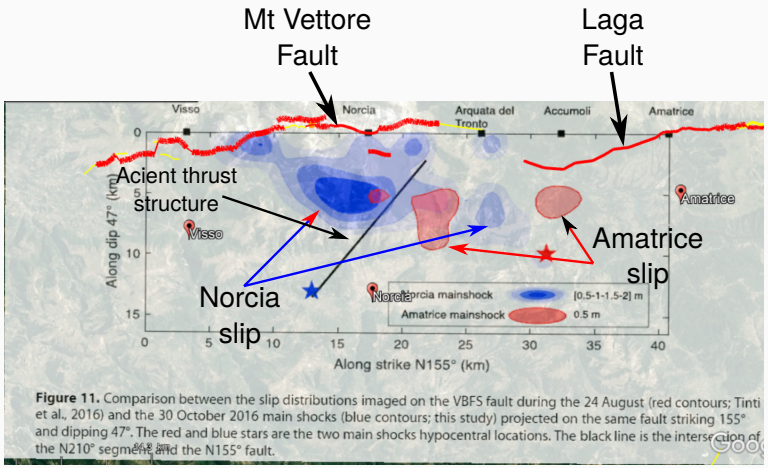

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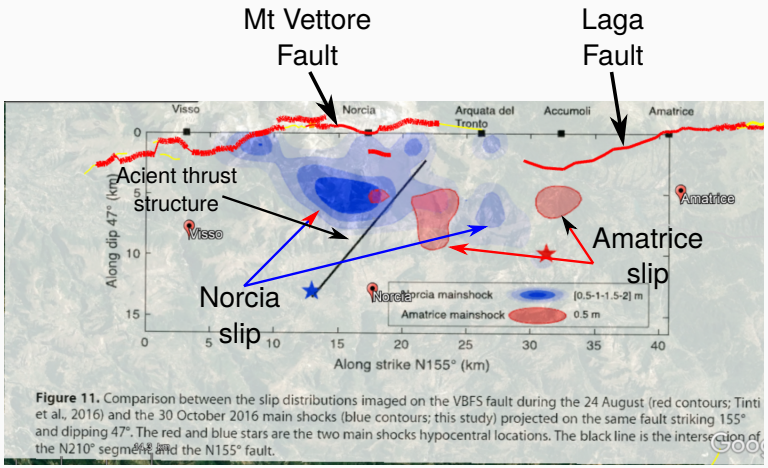

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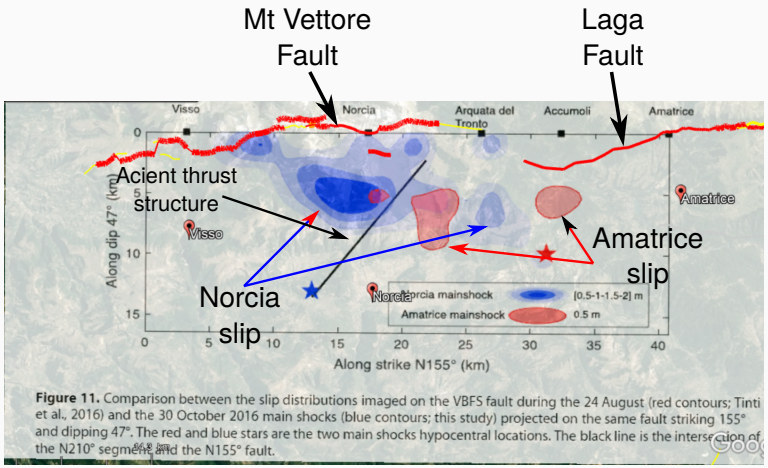

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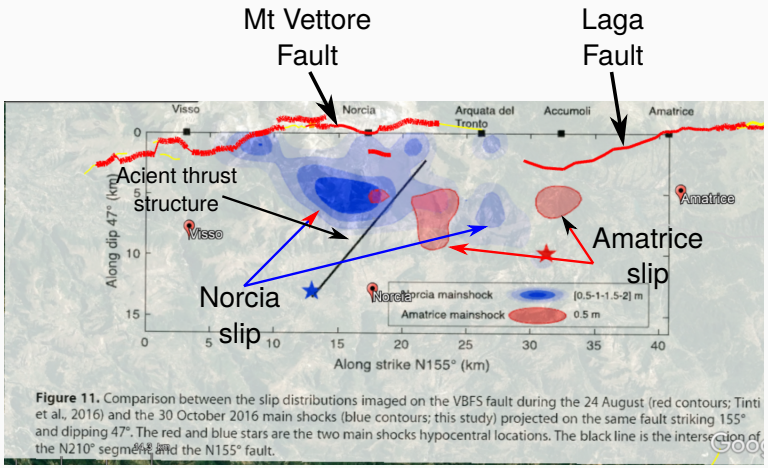

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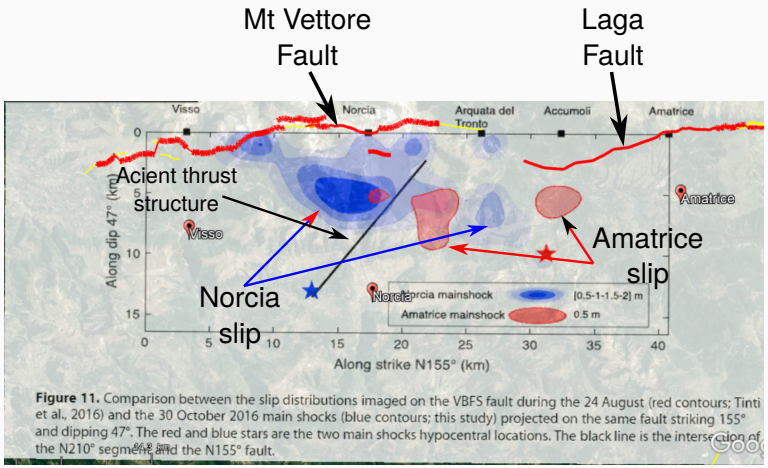

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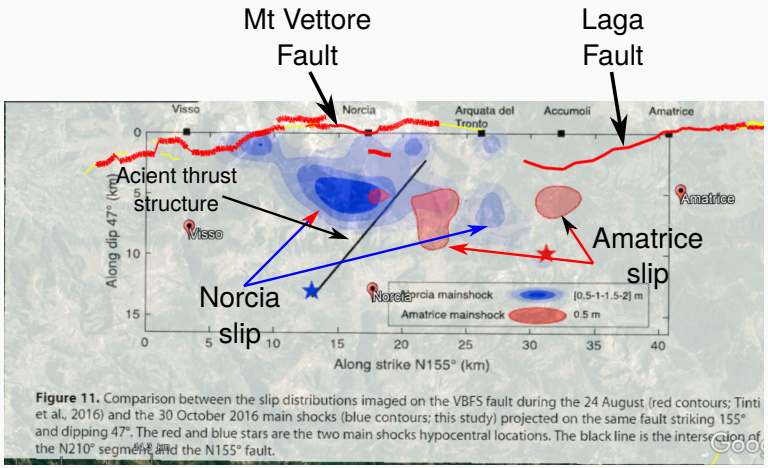

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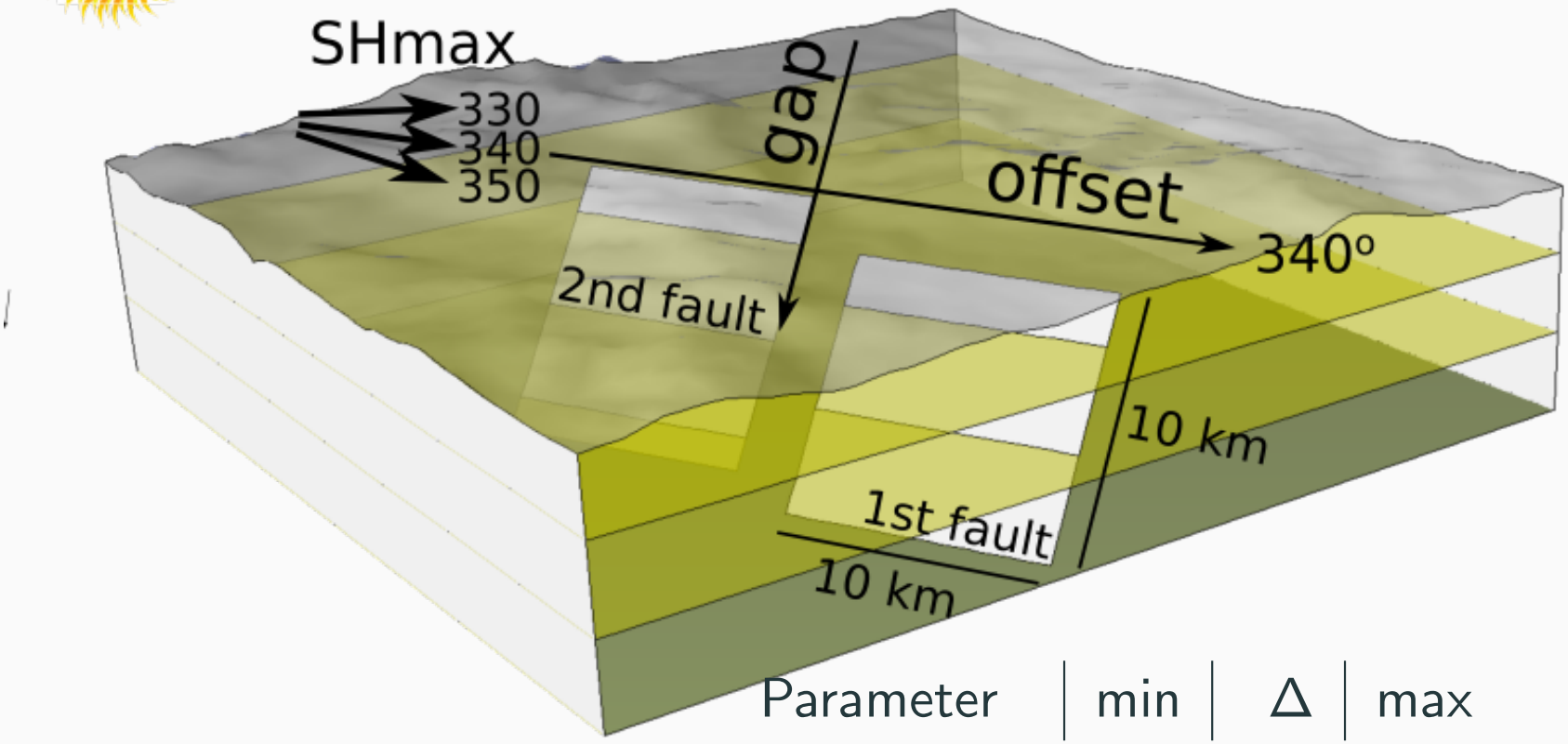
Investigate the physical conditons promoting rupture jumps across step overs regarding normal fault systems

Settings

Geometry and parameters explored



Parameter	min	Δ	max

www.seissol.org

(e.g., Wollherr et al., 2018; Ulrich et al., 2019)

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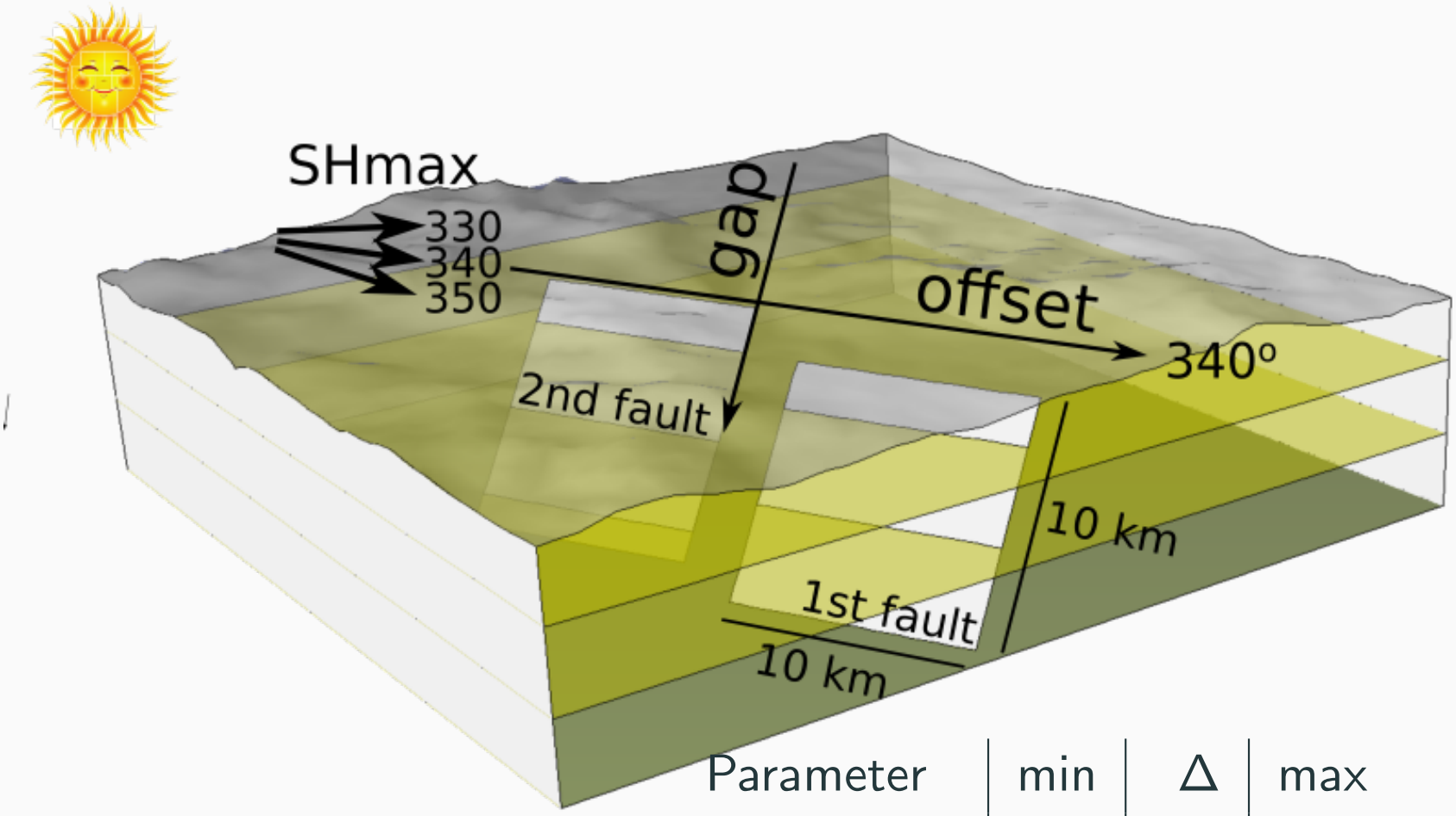

Parameter	min	Δ	max
Offset (km)	-5	2.5	+5

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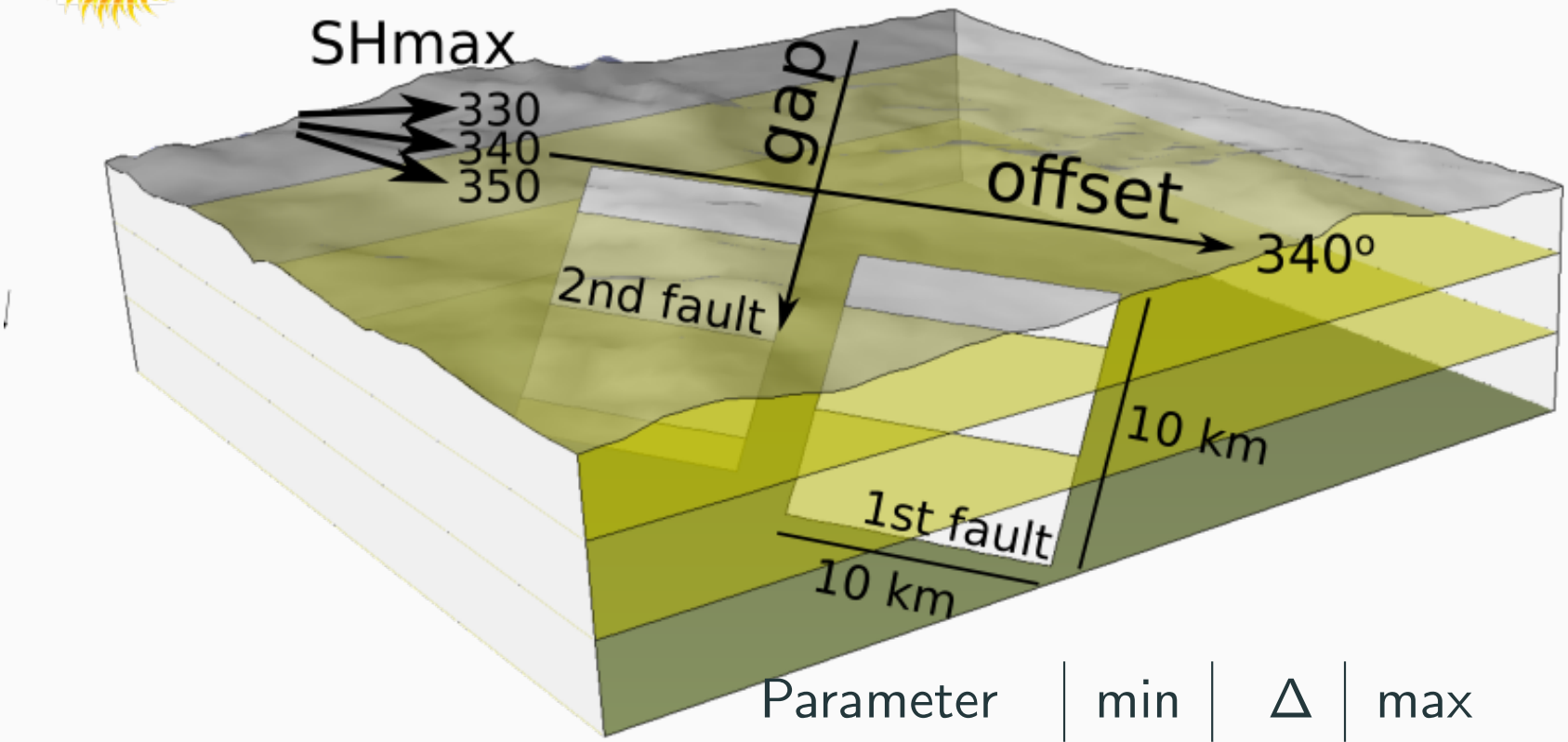

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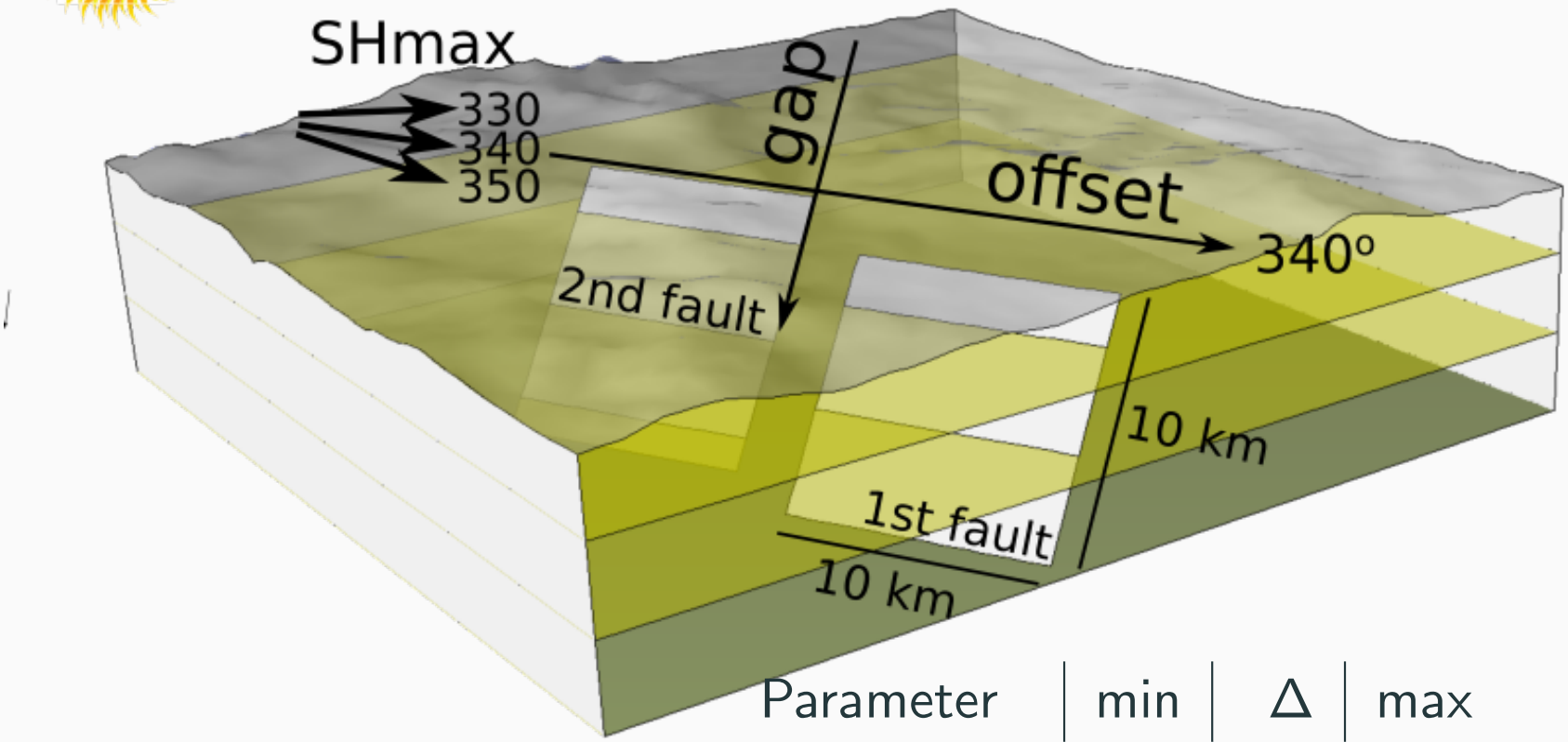

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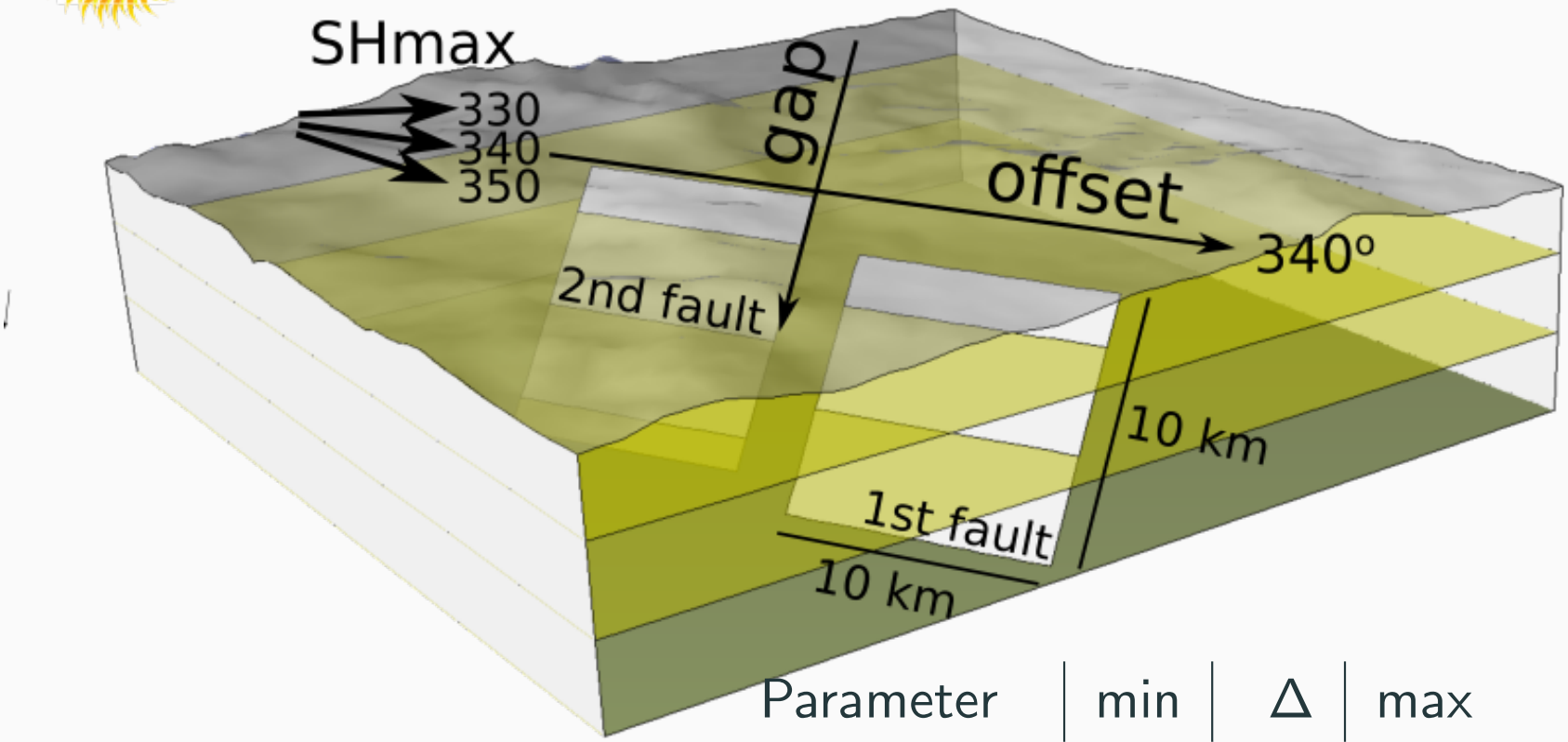

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Offset (km)	-5	2.5	+5
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S	0.1	0.1	0.3
SH_{max} (^{o})	330	10	350

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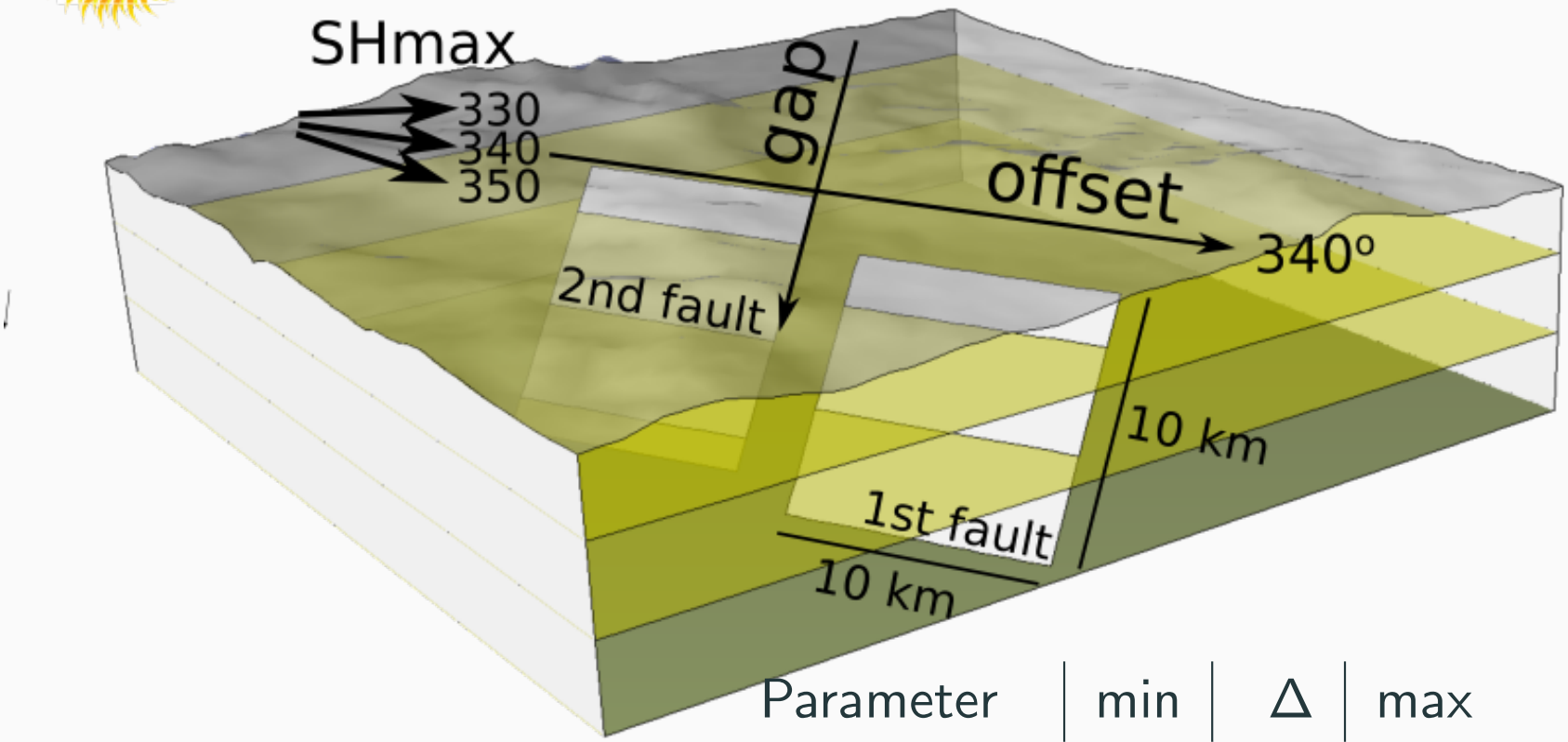

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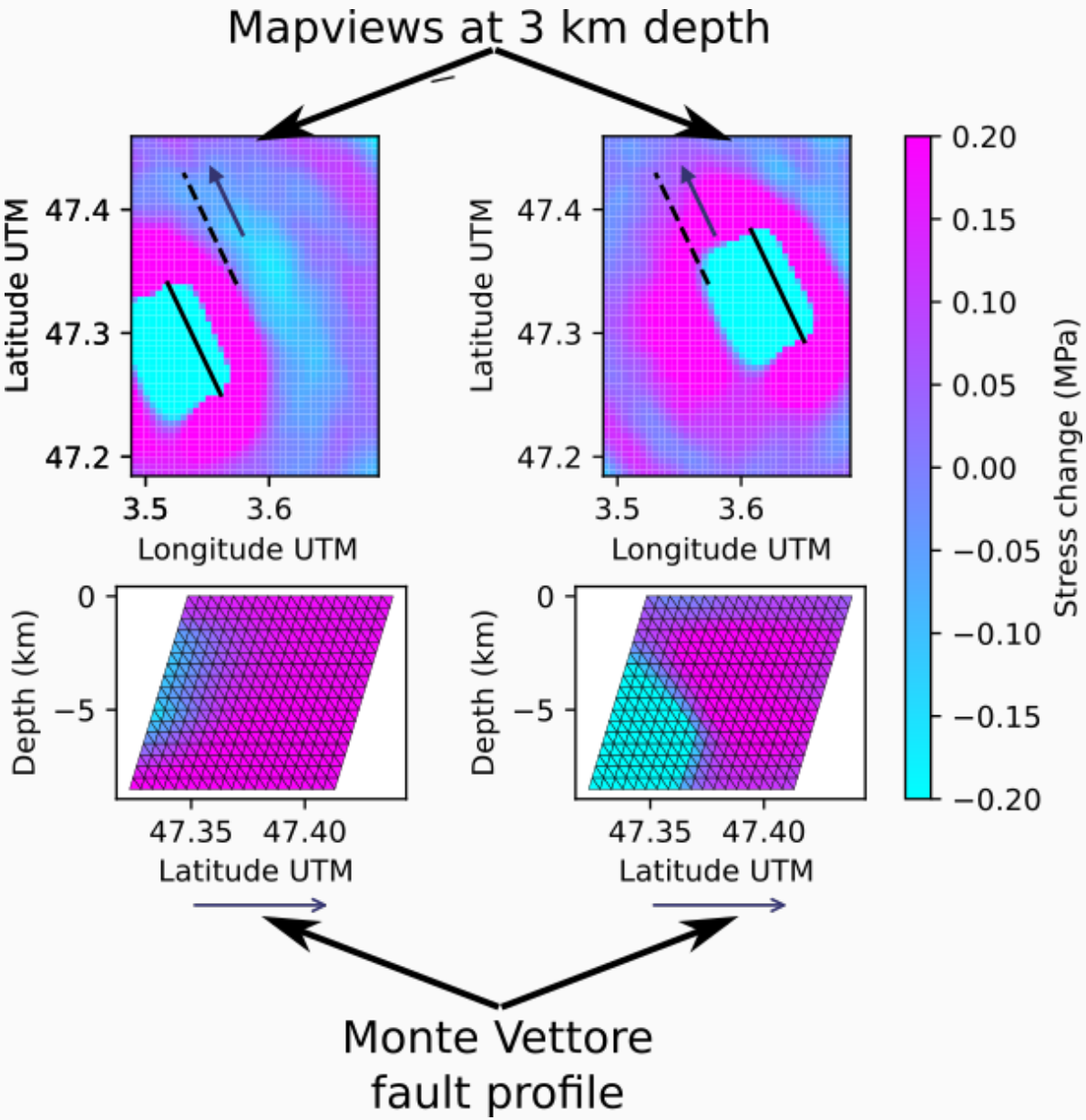
Static analysis ... jump? break-away?



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