Modeling the Global Deep Water Cycle

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Modeling the Global Water Cycle—The Effect of Mg-Sursassite and Phase A on Deep Slab Dehydration and the Global Subduction Zone Water Budget

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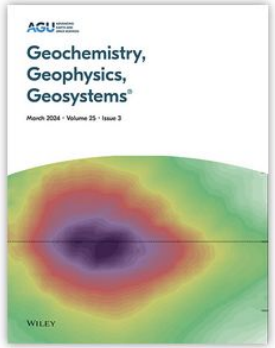

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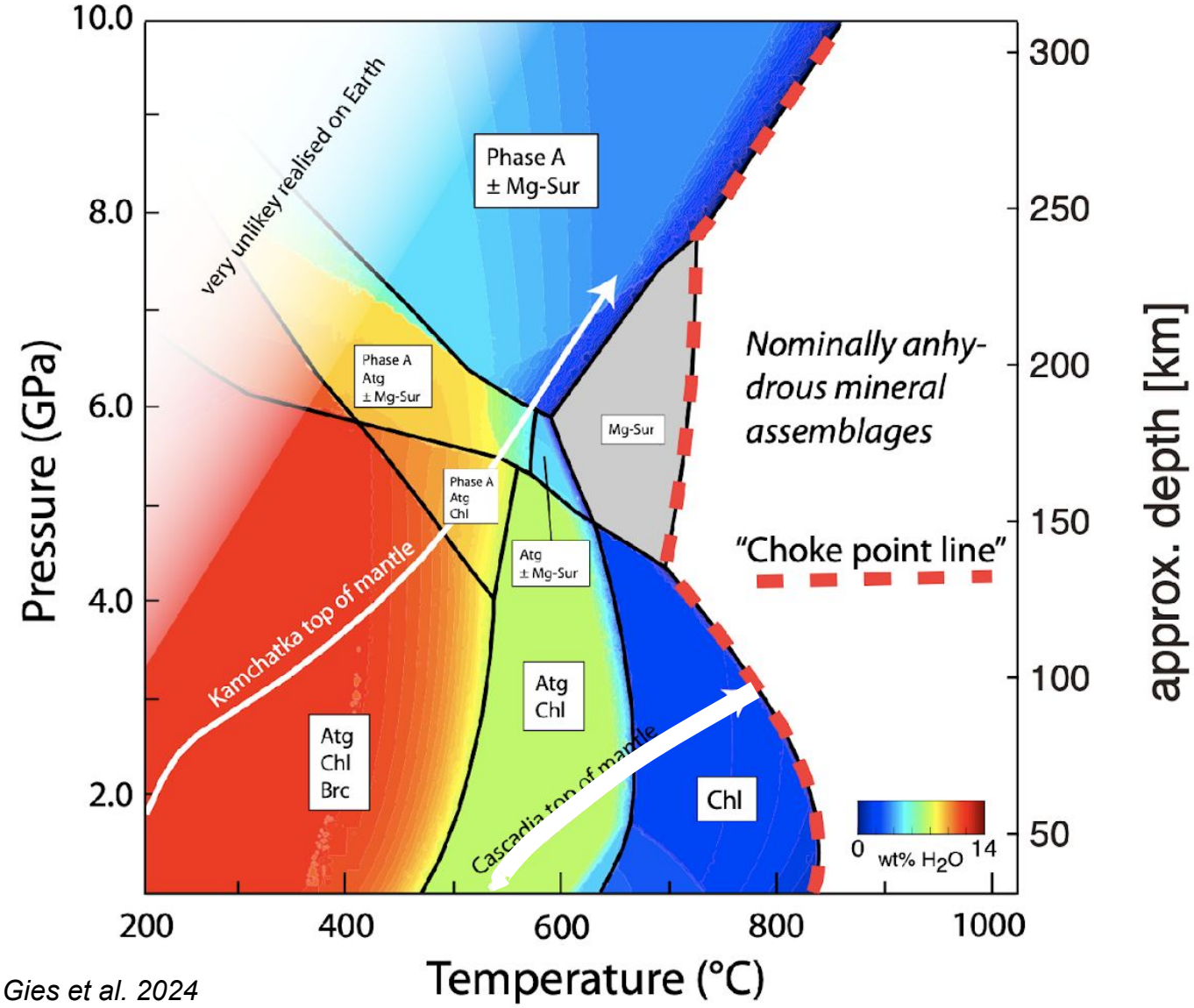
Hot vs. Cold Subduction Zones



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Cold Subduction

- H_2O transport in hydrous phases

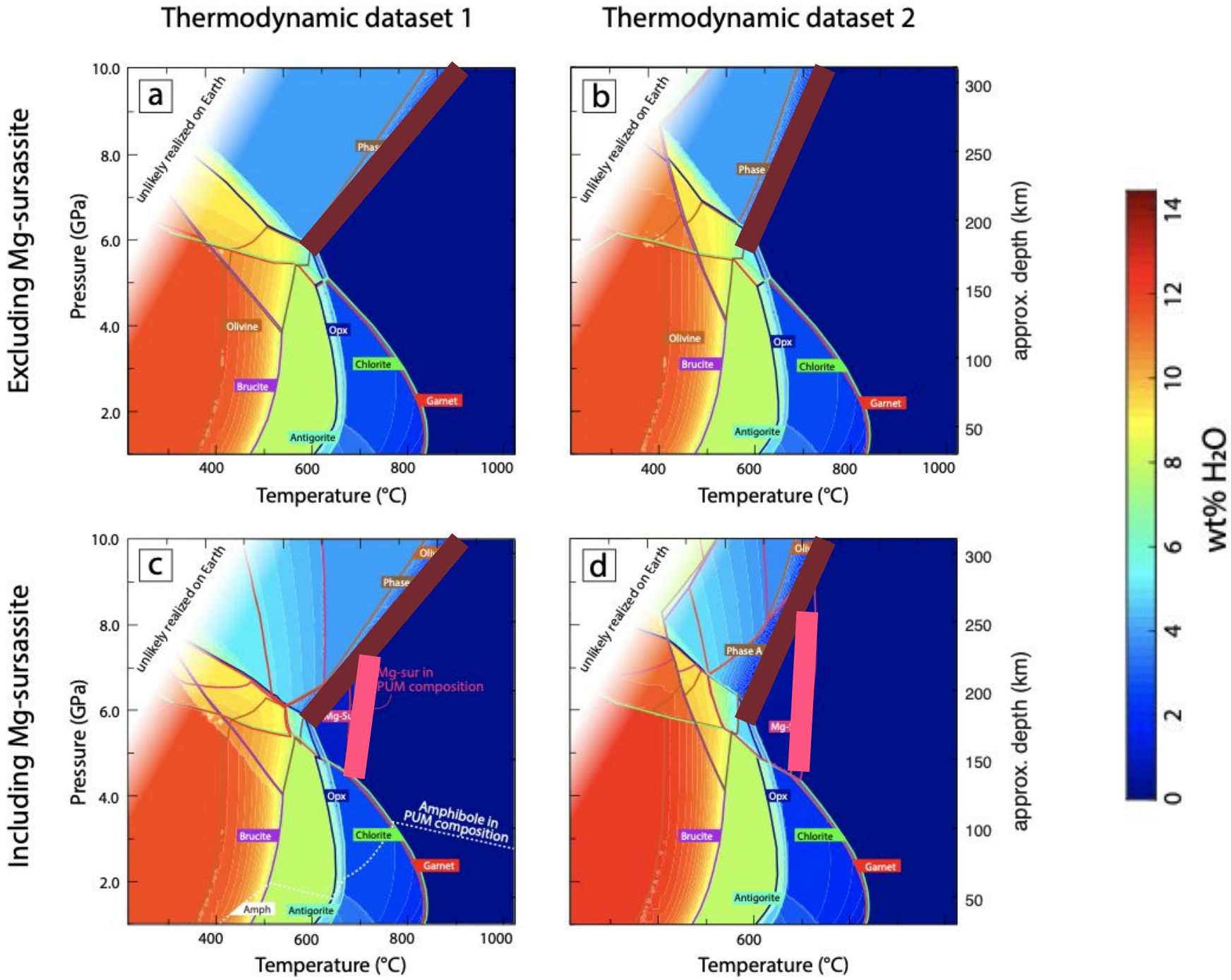
Hot Subduction

- Dehydration of slab at choke point

Phase A
$[Mg_7Si_2O_8(OH)_6]$

Mg-sursassite
$[Mg_5Al_5Si_6O_{21}(OH)_7]$

- Phase A - Komabayashi et al. (2005) vs. Pawley & Wood (1995)
- With and without Mg-sursassite - Grevel et al. (2001)



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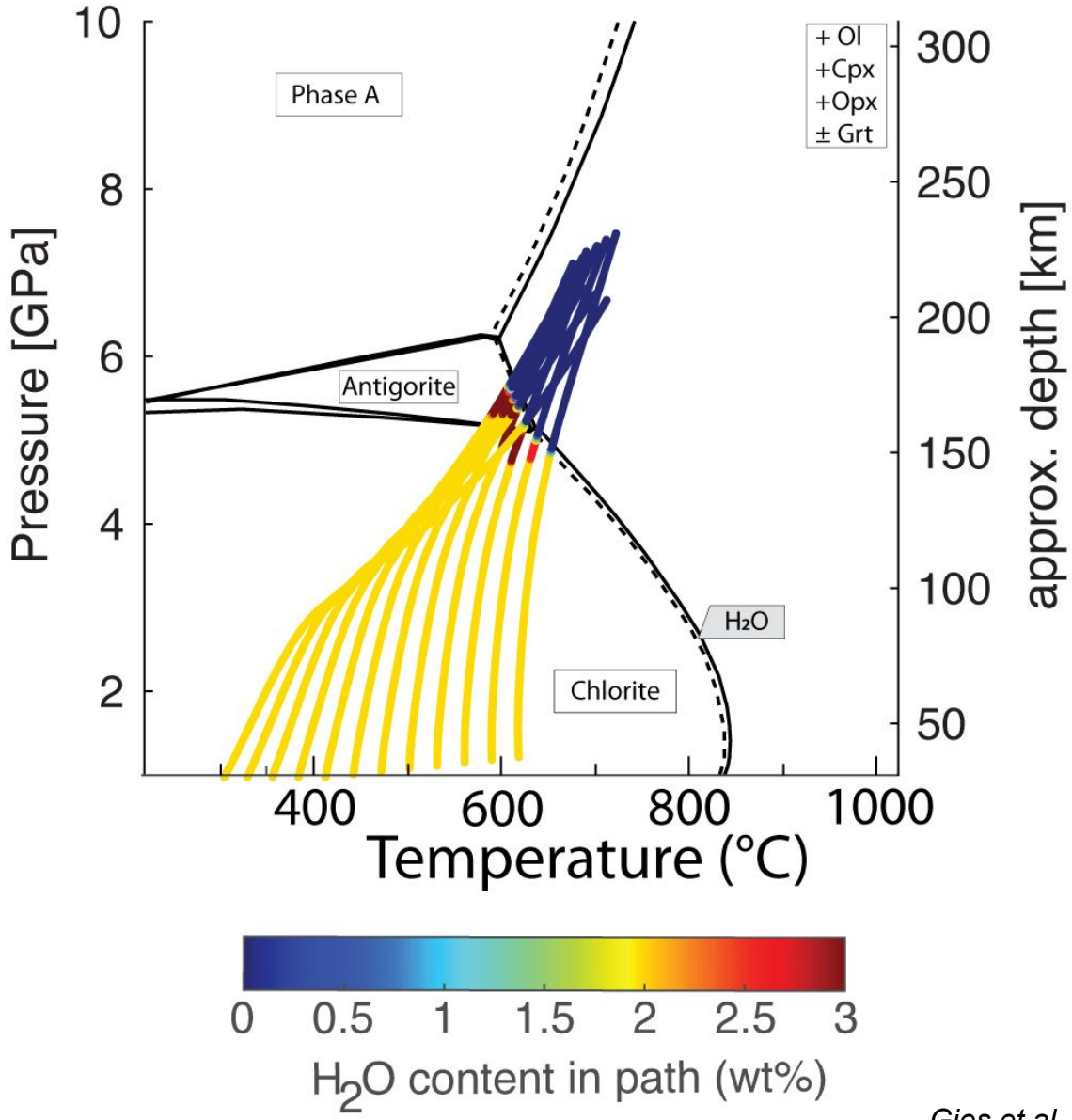
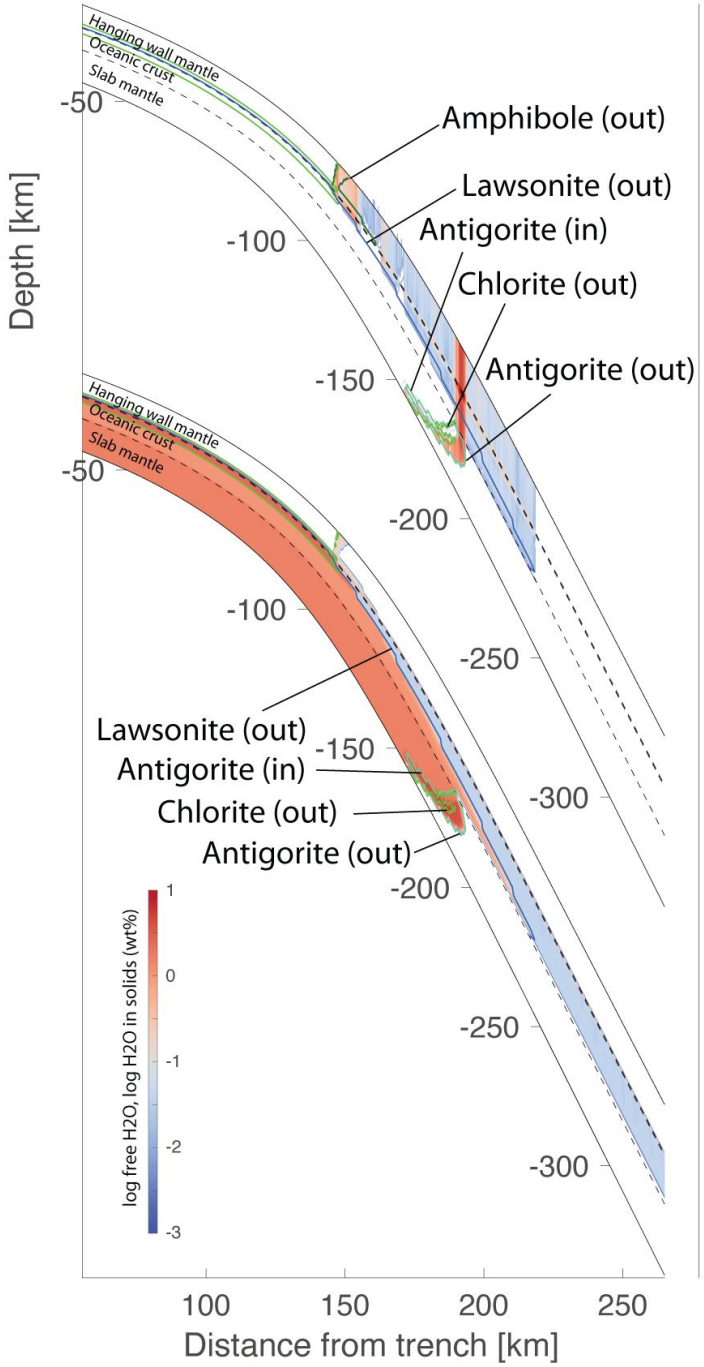
Intermediate SZ – Nicaragua

Murnaghan without Mg-Sur





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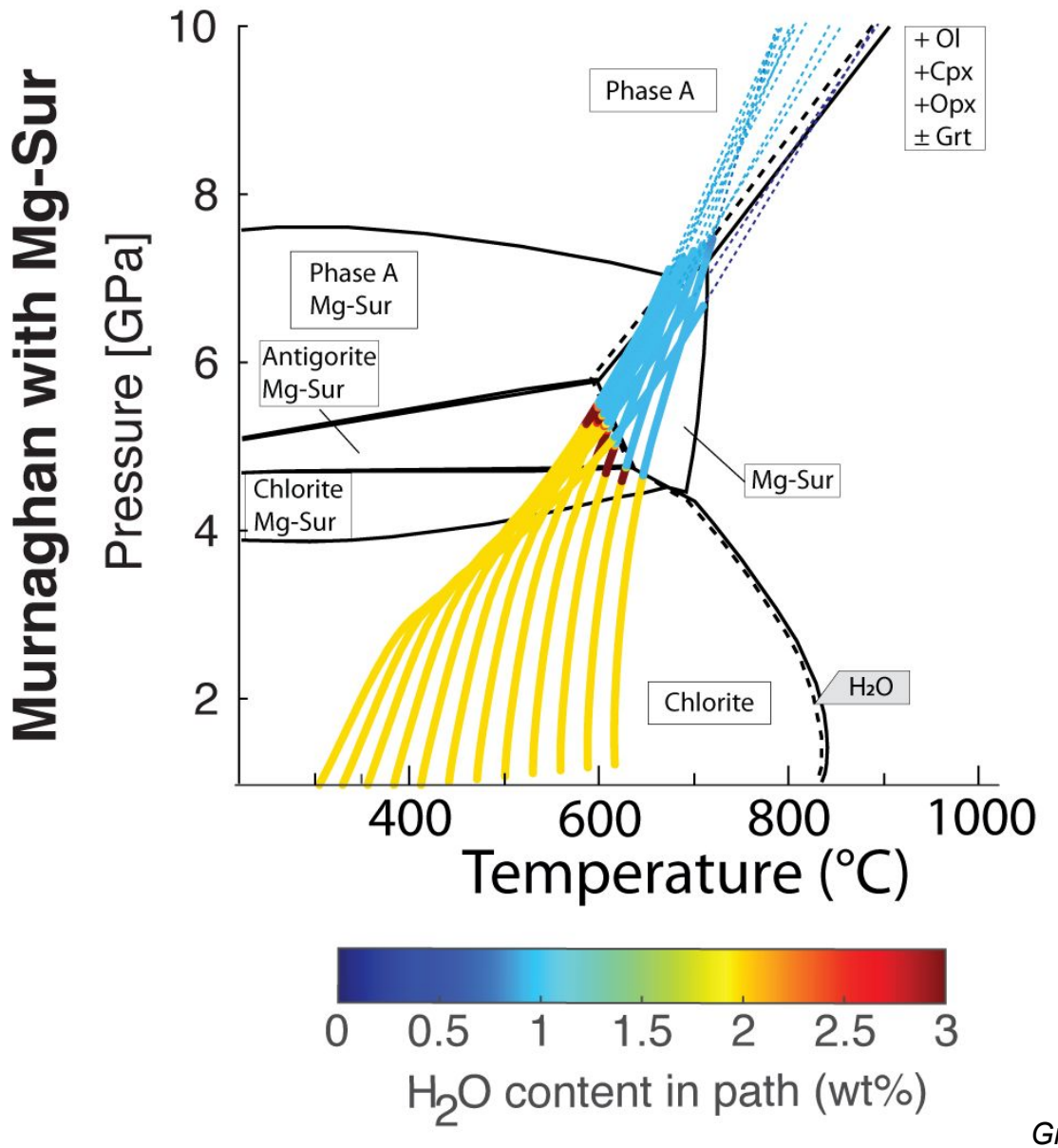

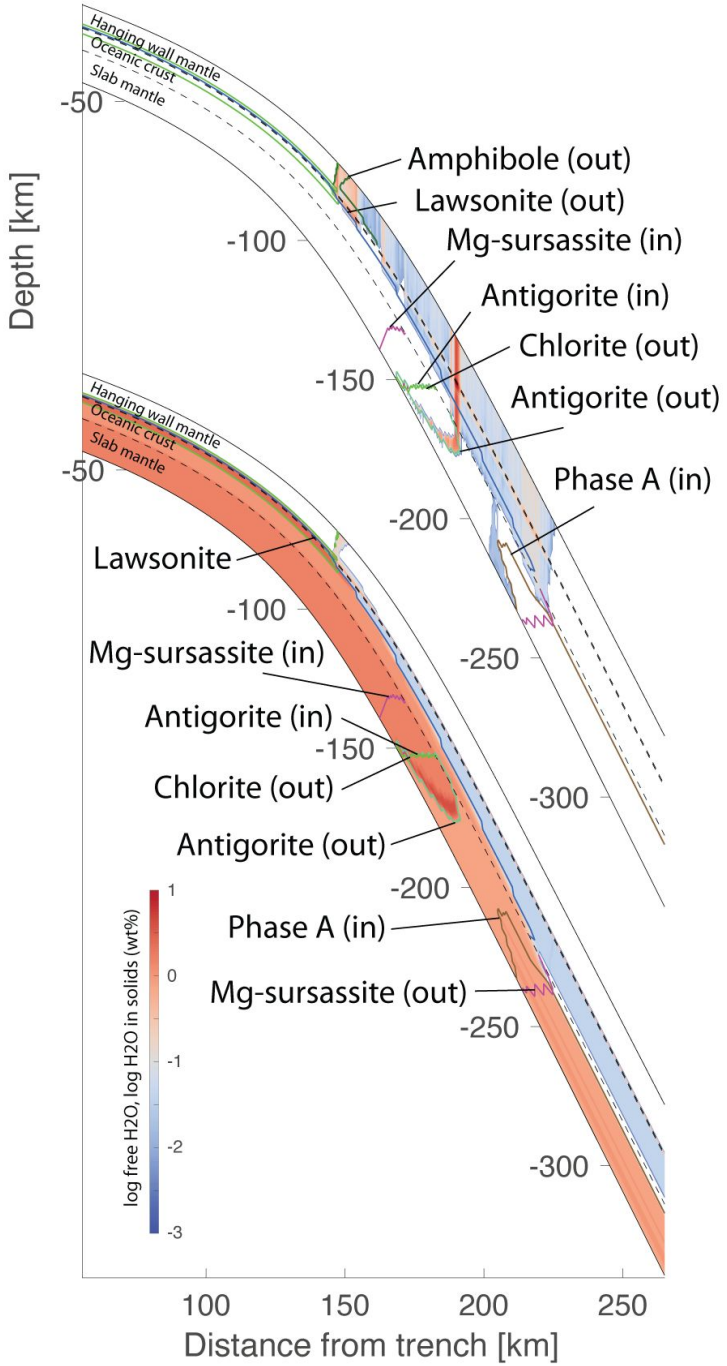

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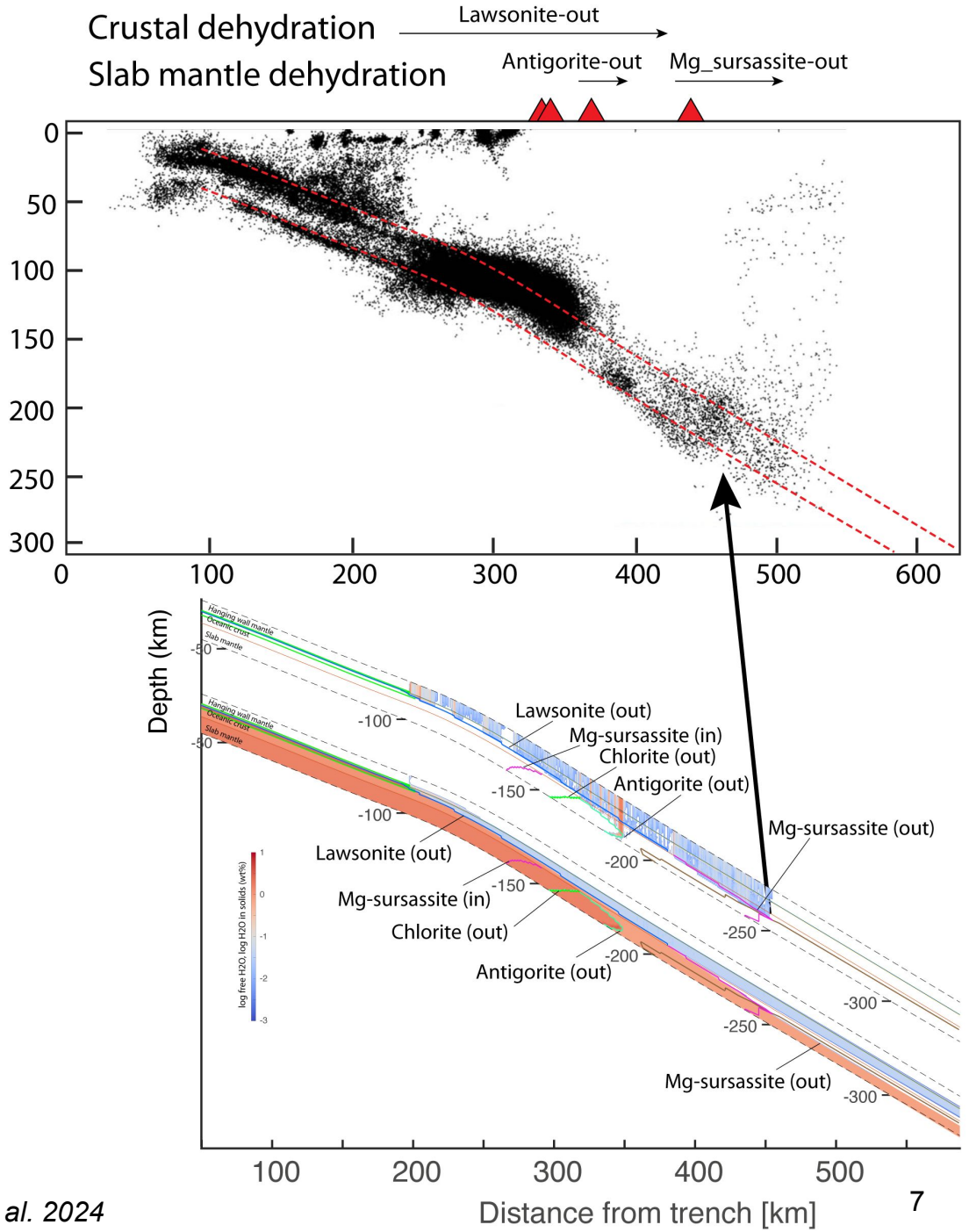
Central Chilean SZ

- Model with Mg-sursassite
- Dehydration from slab mantle
- Location of volcanos in excellent agreement with dehydration reactions
- Deep intra slab earthquakes correlate with Mg-sursassite dehydration



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