

***Interactive comment on* “Stress field orientation controls fault leakage at a natural CO₂ reservoir” by Johannes M. Miocic et al.**

Alan Morris (Referee)

alanmrrs0@gmail.com

Received and published: 3 March 2020

Review by: Alan Morris Scientific significance: Does the manuscript represent a substantial contribution to scientific progress within the scope of Solid Earth (substantial new concepts, ideas, methods, or data)? Yes, I rank this manuscript Excellent (1). This work represents an innovative look at a natural example of stress-state-enhanced fault and fracture permeability. Although the approaches used in the paper are not new, the careful application to a real-world example using an interesting and compelling dataset is an extremely valuable contribution to both the underlying science and possible technical uses addressing a globally significant problem – storage and sequestration of CO₂. Scientific quality: Are the scientific approach and applied methods valid? Are the results discussed in an appropriate and balanced way (consideration of related

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work, including appropriate references)? Yes, I rank this manuscript Excellent (1). See above for the first question. The manuscript is very straightforward, clearly written and alternative interpretations are discussed. The referencing of previous work is comprehensive and appropriate. Presentation quality: Are the scientific results and conclusions presented in a clear, concise, and well-structured way (number and quality of figures/tables, appropriate use of English language)? Yes, I rank this manuscript Excellent (1). Use of English is good, style is concise, and order is logical. It is one of the most fluent manuscripts I have reviewed.

I have made several minor word-change suggestions throughout the manuscript and these are contained in the pdf that I have uploaded with my review.

Please also note the supplement to this comment:

<https://www.solid-earth-discuss.net/se-2020-12/se-2020-12-RC1-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2020-12>, 2020.

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