SIGNIFICANCE OF NON-DC COMPONENTS OF MOMENT TENSORS FOR UNDERSTANDING TECTONIC PROCESSES RELATED TO THE REYKJANES SEISMIC AND VOLCANIC ACTIVITY, ICELAND

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The Reykjanes Peninsula in SW Iceland is a part of the Mid-Atlantic plate boundary. It forms its transtensional segment with several volcanic and faulting systems. We focus on seismicity that occurred in the central part of Reykjanes at the place of the Fagradalsfjall volcano prior to and after its eruption on March 19, 2021. We invert well-determined focal mechanisms and provide mapping of tectonic stress in space and time. Our results disclose heterogeneous stress field manifested by mix of shear, tensile and compressive fracturing. The prominent stress direction was in the azimuth of 120° ± 8°, which represents the overall extension related to rifting in the Reykjanes Peninsula. The activity associated with the transform fault segment displaed predominantly shear strike-slip events. The non-shear fractures were associated with the opening of volcanic fissures trending in the azimuth of 30–35°, perpendicular to the extension. The dip-slips were mainly located close to the volcanic dike. Importantly, we detected local variation of stress when the stress axes abruptly interchanged their directions in the individual stress domains. These stress changes are interpreted in a consequence of plate spreading and upcoming fluid flow during a preparatory phase of a rifting episode.