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**Industry-related problem: Rogue waves in the Agulhas Current Region**

Ocean waves in the Southern African region are caused by the interplay of wind, current, bathymetry, tides, etc. Recently South Africa has been experiencing a high frequency of rogue/freak waves in the Agulhas Current Region, especially in the winter season and at times in the summer season which has resulted in loss of life, livelihood, flooding, and damage to infrastructure [e.g., shipping, harbors, ports, etc.]. The rogue wave problem is centered around finding out the contribution of the wind-wave-current, wind-wave-bathymetry [*see figure 1. - bathymetry*], wind-wave-tide, and to some extent swell-tide-bathymetry-current interplay towards making waves extreme/severe in the Agulhas Current Region [*see figure 2.*] of Southern Africa.

It is evident from some of the previous studies [*e.g., Salonen UCT MSc Thesis, 2019; Wang and Sheng, 2018; Wang et al., 2023; Tolman, 1990; Dysthe, 2008; Ardhuin et al., 2012; Ardhuin et al., 2017; Heller et al., 2008; Marechal and Ardhuin, 2021; Villas-Boas and Pizzo, 2021; White and Fornberg, 1998; Voronovich et al., 2008*] that the extremity of the waves could be related to the interaction of the waves/swells with the bathymetry, current, and tides. A few rogue wave mechanisms [e.g., spatial focusing, dispersive focusing, nonlinear focusing, modulational instability, etc.] have previously been examined by various literature [*e.g., Didenkulova et al., 2023; Fedele et al., 2016; Malila et al., 2022; Kharif and Pelinovsky, 2003, etc.*] in formulating and solving the rogue wave problem in deep and shallow waters, and some could potentially be applied in the Southern African context. The ultimate ideal is that the rogue wave solution that is formulated during the MISG 2024 meeting week be applied in both deep and shallow waters.



Figure 1: GEBCO Bathymetry. Light-colored-shallow regions; Dark-colored-relatively deeper regions.



Figure 2: The Greater Agulhas Current System, after Lutjeharms, 2001

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