**2D WAVE SPECTRA AND SSB IMPLEMENTATION**

**TWO SEA STATE BIAS THEORIES**

**COMPARING THE THEORY WITH EMPIRICAL MODELS at Ku-band**

**CONCLUSIONS**

**REFERENCES**

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**ABSTRACT**

Two theoretical formulations of the sea state bias (SSB) by Srokosz (1986) and Elfouhaily et al. (2000) are applied to directional ocean wave spectra from WAM and from NDBC moored buoys. The SSB model of Elfouhaily et al. (2000) for the calculation of the sea state bias was based on the work of Srokosz (1986) and on a two-scale approach in the work of Elfouhaily et al. (2000) for the calculation of the SSB in the wind sea range. The theoretical SSB is compared with empirical SSB models calculated from the collected directional spectra. The results are shown for a three day storm event, consisting of an increasing-and-decreasing easterly wind (3-day storm event) against the r.m.s. slope. The SSB model is better parameterised in terms of the slope of long gravity waves. This may be related to the development of the SSB model in the wind sea range.

**COMPARISON OF SEA STATE BIAS ESTIMATES FROM THEORY AND RECENT EMPIRICAL MODELS**

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**Three day storm event**

**REFERENCES**

**Figure 1:** Empirical characterisation of the SSB coefficient generally parameterised in terms of the significant wave height, Sw, the wind speed, W, and the wind direction, D. The empirical SSB coefficient and the SSB coefficient from Elfouhaily et al. (2000) are shown for the three directional spectra. The SSB coefficient from Elfouhaily et al. (2000) is better parameterised in terms of the slope of long gravity waves.

**Figure 2:** Theoretical SOB coefficient (in %) after Srokosz (1986) calculated for three directional spectra, and an 18% spectral tail extension shown against top: long wave depth, middle: long wave slope, bottom: cross slope.

**Figure 3:** Theoretical SOB coefficient (in %) after Elfouhaily et al. (2000) calculated for three directional spectra, and a 18% spectral tail extension shown against top: long wave depth, middle: long wave slope, bottom: cross slope.

**Figure 4:** Theoretical SOB coefficient (in %) after Elfouhaily et al. (2000) calculated for three directional spectra, and a 18% spectral tail extension shown against top: long wave depth, middle: long wave slope, bottom: cross slope.

**Figure 5:** shows the relation between SSB coefficient and r.m.s. slope for three empirical models and the Elfouhaily et al. (2000) results. The SSB coefficient is better parameterised in terms of the slope of long gravity waves.

**Figure 6:** shows the quasi-linear relationship between r.m.s. slope and wind speed for three empirical models and the Elfouhaily et al. (2000) results. The SSB coefficient is better parameterised in terms of the slope of long gravity waves.

**Figure 7:** shows the quasi-linear relationship between r.m.s. slope and significant wave height for three empirical models and the Elfouhaily et al. (2000) results. The SSB coefficient is better parameterised in terms of the slope of long gravity waves.