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Boreal Summer Intraseasonal oscillation convective initiations in S2S models

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Boreal summer Intraseasonal Oscillation (BSISO), with its 20–90 day periodicity characterised by northward propagation over the northern Indian Ocean and eastward propagation over the equatorial region, acts as a major source of predictability in the intraseasonal time scale. Predicting the initiation of BSISO over the equatorial Indian Ocean is of vital importance in the prediction of BSISO's northward advancement over the ISM domain. This study tries to investigate where we stand in terms of predicting the BSISO initiation and propagation, making use of the reforecasts available from the different operational forecasting centres part of the Sub-Seasonal-to-Seasonal (S2S) prediction project. The BSISO convective initiations over the Equatorial Indian Ocean are objectively identified using OLR MJO Index(OMI), and the ability of the models to simulate the initiation and propagation of BSISO is assessed. The BSISO propagation skill, quantified in 9 S2S models, ranges from 11 to 29 days, while the BSISO initiation skill, quantified in 4 out of 9 models, ranges from 11 to 16 days, which is systematically lower compared to the skill of the BSISO non-initiation stages. Two major regions of BSISO initiation were identified, one over the Western Equatorial Indian Ocean and another over the Eastern equatorial Indian Ocean. Over these identified initiation regions, observation show a buildup (reduction) of lower tropospheric moisture before (after) the BSISO initiation. Out of the 9 models considered, few capture either the buildup or reduction, while the majority of the models show biases in capturing the moisture buildup and reduction. Previous studies have emphasised the role of background moisture in the propagation of BSISO. The relationship between the background moisture gradient over the ISM domain and the BSISO propagation prediction skill is examined in the S2S models and a positive relationship is found.