学 位 論 文 内 容 の 要 旨

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学 位 論 文 題 名

Origin of Intraseasonal Variability in the Eastern Equatorial Indian Ocean: Intrinsic Variability, and Local and Remote Wind-Stress Forcings

（赤道東インド洋の季節内変動の起源：内在的変動、遠方および局所的な風応力強制）

Eastern equatorial Indian Ocean (EIO) experiences large intraseasonal variability (ISV), which arises from instability or is induced by local and remote atmospheric forcings. We investigate the relative contributions of instability and local and remote forcings to ISV in EIO by conducting a set of numerical model experiments using Regional Ocean Model System over the Indian Ocean with grid interval of 0.25° in longitudes and latitudes. In the standard experiment, the model is forced year-to-year varying forcings for 20 years (1996–2015). We account the first 10 years as the necessary period to spin up.

To distinguish ISV originating from instability and that caused by atmospheric forcings, another experiment which has the identical year-to-year forcings from 2006 to 2015 but after 9-year spin-up period is conducted. High (low) correlations of ISV between the two experiments indicate that the ISV is induced by atmospheric forcings (arises from instability). For 100 m temperatures, high correlations larger than 0.7 are limited only in the central to eastern equatorial Indian Ocean and near the eastern boundary, thereby indicating that ISV in these regions is dominated by effects of atmospheric forcings. For SSTs, atmospheric forcings play a larger role than those in 100 m temperature, and high correlations between the two experiments are also found in the northern Indian Ocean. Atmospheric forced ISV in zonal velocity has shallower vertical penetration than temperature.

To understand a role of atmospheric forcings, especially those of wind-stress, four

regional forcing experiments are moreover conducted. In the first two experiments, wind-stress ISV is retained over western (west of 80°E) or eastern (east of 80°E) region, while in the other two experiments the latter forcing region is further subdivided into middle eastern (80°–100°E) and far eastern (east of 100°E) regions. Local forcing dominantly creates ISV in SST. In the subsurface, remote forcing also plays an important role in ISV of SST. Especially, below the thermocline, the influence of western forcing cannot be neglected on ISV in SST, even it exceeds that of eastern forcing (east of 80°E) near the eastern boundary of equator. The forcing east of 100°E plays a generally minor role than that between 80°-100°E, but cannot be ignored ISV near Java coast.