基于海洋二号 B/C、中法海洋卫星宽刈幅海浪观测以及哨兵 1 号海浪方向谱观测同化的研究

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更好地预测海浪要素参数在估计海洋和大气之间的动量/热通量交换方面具有关键作用。基于深度学习技术，我们现在能够基于传统海洋动力卫星获得宽刈幅海浪有效波高遥感观测 Wang et al. (2021)。进而我们将海洋二号 B/C(HY-2B/C)、CFOSAT 的宽刈幅海浪有效波高以及 Seninel-1 的海浪方向谱同化进入海浪数值模式，并评估上述数据对于海浪数值预报精度的影响；同时，我们也开展了海浪数值模型与海洋数值模式模型的耦合数值预报实验来研究同化上述卫星海浪遥感数据后对于海洋混合层的影响。

在 DRAGON-5 项目期间，我们已经处理并获得了 HY-2B/C、CFOSAT 两年的宽刈幅海浪有效波高数据集，并将该数据同化进入海浪数值模型中，利用高度计和波浪浮标等独立数据对同化的结果进行了验证。检验结果表明，同化宽刈幅海浪有效波高以及海浪谱后能够很好地提高了捕捉严重风暴产生的涌浪初始条件的能力。更重要的是，我们发现在不同波长尺度下使用波谱仪与 SAR 能够对两种遥感数据很好的互补，从而显著改善了关键海洋区域（如南大洋）的风浪增长的模拟。

更详细的结果与结论将在口头报告中进行展示。

On the assimilation of wide swath SWH and directional wave observations : A synergy between HY2B/C, CFOSAT and Sentnel-1

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Abstract:

Better prediction of sea state integrated parameters has a key role in the estimate of momentum and heat fluxes exchanges between ocean and atmosphere. By using deep learning technique we are now able to retrieve Significant Wave Height on the wide swath of scatterometer, as proposed by Wang et al. (2021). The objective of this work is to assess the impact of assimilating wide swath SWH and directional wave spectra from CFOSAT and Seninel-1 on the wave forecasting. We also investigated the impact of improved wave forcing on the ocean mixed layer in a coupled experiment of wave model and ocean model.

During the DRAGON-5 project we have processed two years of wide swath SWH from HY-2B/C and CFOSAT mission. Wave model runs have been performed with data assimilation and control run for this long period. The validations of the results have been implemented with independent wave data from altimeters and also from buoys networks.

The results show the capacity of using wide swath SWH and directional wave spectra to track and well capture the initial conditions of swell generated in severe storms. We also highlight the complementary of using SWIM and SAR wave spectra for different wavelength scales. This significantly improves the wind-wave growth in critical ocean regions such as the Southern ocean.

Further comments and conclusions will be given during the oral presentation.