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论文

海潮对卫星重力场恢复的影响

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摘要 本文讨论了海潮对卫星重力测量的影响问题. 首先介绍了海潮对卫星重力测量影响的基本理论；采用FES02和TPXO6海潮模型计算了海潮负荷对卫星重力结果前60阶的影响；并用两个模型之间的差异作为海潮模型精度的估计量，据此计算了海潮模型误差对卫星重力结果的影响. 与GRACE恢复的重力场精度的比较说明：海潮对重力场40阶以下的影响都超过了目前重力场恢复精度；尽管由于卫星测高技术的发展，海潮模型的精度有了很大的提高，但目前的全球海潮模型用于GRACE重力场恢复的前12阶的改正还是不够精确. 另外，我们也利用中国东海和南海潮汐资料以及FES02海潮模型讨论了中国近海潮汐效应对GRACE观测的影响. 结果说明该影响与海潮模型的误差相当. 这反映了当前海潮模型的不确定度，因此通过结合全球验潮站资料有望提高海潮对卫星重力测量的改正精度.

关键词 卫星重力场 海潮改正 月均值 近海潮汐

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Effect of ocean tide on recovery of satellite gravity field

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Abstract The problem of the ocean tide effect on satellite gravity is discussed. The basic theory is introduced firstly. And then two global ocean tide models are used to estimate the loading effect up to harmonic degree 60, and the difference of the two ocean tide models is considered as the error estimation. The comparison between the numerical results and the standard deviation of gravity recovered with GRACE shows that the effect of ocean tide on satellite gravity is more serious than the error of the GRACE below degree 40 Although the accuracy of ocean tide models are improved with development of satellite altimetry, the current ocean tide models are not accurate enough for ocean tide correction to the GRACE below degree 12 Additionally, the effect of the local ocean tide in the vicinity of China is also investigated using tidal data of the East and South China seas and global model of FES02 The result shows that this effect is comparable with that of the current global ocean tide model error. This indicates the uncertainty of the current ocean tide model. Therefore, the accuracy of ocean tide correction to satellite gravity will be improved by combining more local tide data obtained with tide gauge observations.

Key words Satellite gravity field; Ocean tide correction; Monthly averaged value; Local ocean tide

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