The Earth’s dynamic figure parameters, including the inertia tensors and dynamic flattenings of the whole Earth and its internal layers, are fundamental parameters for geodetic, geophysical and astronomical studies. Until recently, the recommended values for these parameters by IAG were solved based on the JGM-3 gravity model with some parameters (namely GM and a) adjusted. Recently, some new models (such as EIGEN-51C and EGM2008) with unprecedented accuracies were released. Contrast to the ~1-meter-accuracy geoid of JGM-3, the global geoids determined by EIGEN-51C and EGM2008 can reach accuracies of ~0.3 and ~0.2 meter respectively. Thus it is quite necessary to re-estimate the inertia tensor for general applications. We find that adopting these new gravity models can bring significant improvements to the values of the inertia tensor (the uncertainties are reduced by at least one order of magnitude). Further, using these new values as constrains, we revised the figure parameters of the MHB2000 Earth model, which was used to establish the IAU2000 precession-nutation model. Finally, we provide the figure parameters (namely the principal inertia moments, the polar and equatorial dynamic flattenings) for an Earth model with a triaxial mantle, a triaxial fluid outer core, and a triaxial solid inner core. Taking into account the fact that the triaxialities of the Earth are not important in many cases, we also provide a corresponding version for the rotationally-symmetric stratified Earth. This study is supported by the National Natural Science Foundation, China (No.40974015).