Continuous efforts made to merge near-surface and satellite data on Earth require accurate data processing. A common practice in magnetism is to analyse the magnetic field in spherical harmonics along the satellite orbits. This approach, which dates back to the early age of the satellite era, is a very simple and efficient way to roughly separate the internal and external fields contributing to the total field. It is often routinely applied although it has long been suspected to cause errors. In this paper, we proceed gradually and highlight some inconsistencies for both internal and external field studies. We show that it is responsible for an aliasing that may lead to flawed conclusions: an apparent secular variation for the internal field and an artificial asymmetry for the external field. Then, with the help of synthetic and real magnetic field measurements, we illustrate and compare its efficiency for investigations of the Moon, Mars and Earth's crustal fields (although our formulae are valid for any planetary magnetic field surveyed by polar satellites). We show that the along-track analysis allows correcting for the external field but that the correction is correlated with the crustal field. For the Earth's crustal field, we quantify this error and display its distribution in the spatial and the spectral domains. Some of our conclusions are not novel and have been sensed for decades. However, our analytical results illustrate the pros and cons of the along-track analysis and should allow us to avoid the pitfall of geophysical overinterpretation.