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Uncertainties on plastic concentration estimates at sea

Matthieu Mercier¹, Marie Poulain-Zarcos^{1,2}, Alexandra ter Halle², Marion Saint-Martin^{1,3}, and Florian Simatos³

¹CNRS-IMFT, UMR 5502, Université de Toulouse, Toulouse, France (matthieu.mercier@imft.fr)

²CNRS-IMRCP, UMR 5623, Université de Toulouse, Toulouse, France

³ISAE-SUPAERO, Université de Toulouse, Toulouse, France

The large difference between the estimates of global plastic input in mass in the oceans (Jambeck et al., *Science* **347**, 2015) and current global predictions from numerical models (van Sebille et al., *Environ. Res. Lett.* **10**, 2015) or observations (Cózar et al., *P. Natl. Acad. Sci.*, **111**, 2014) is one of the most important issue regarding oceanic plastic litter. Yet, global predictions are based on observations, and uncertainties on the latter are rarely considered to provide error bounds on the former.

We discuss here the sources of uncertainties on plastic concentrations estimates (in number and mass), based on a recent model presented in (Poulain et al., *Environ. Sci. Technol.* **53**, 2019). The two main sources of error are the plastic rise velocity and the model for the turbulent diffusivity, although they do not have the same importance. We validated the model with controlled laboratory experiments. Applying this model to global predictions provides us with more realistic encompassing values for the mass of plastic at sea, with a more important correction concerning small microplastics (with characteristic dimensions smaller than ~1mm).