Supplementary Information
Microplastics size dependent fragmentation model
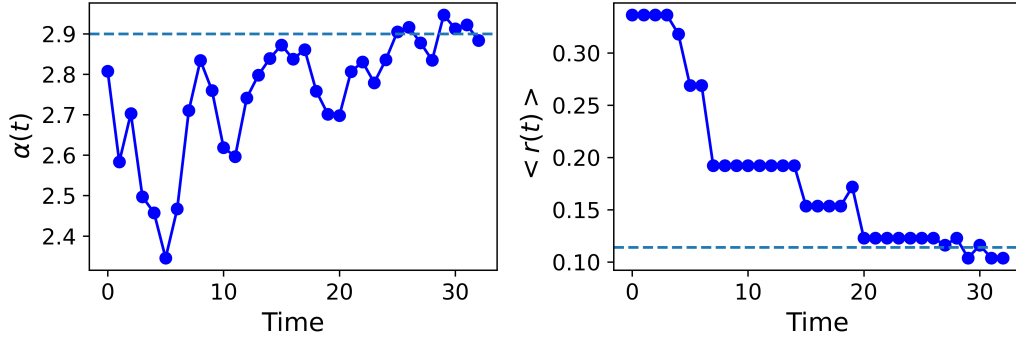
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Figure S1: Time evolution of the power-law slope $\alpha(t)$ (left panel) and the average size $\langle r(t) \rangle$ (right panel). Dashed lines correspond to the asymptotic values of α and $\langle r \rangle$. Parameters as in Fig.1 in the main text.
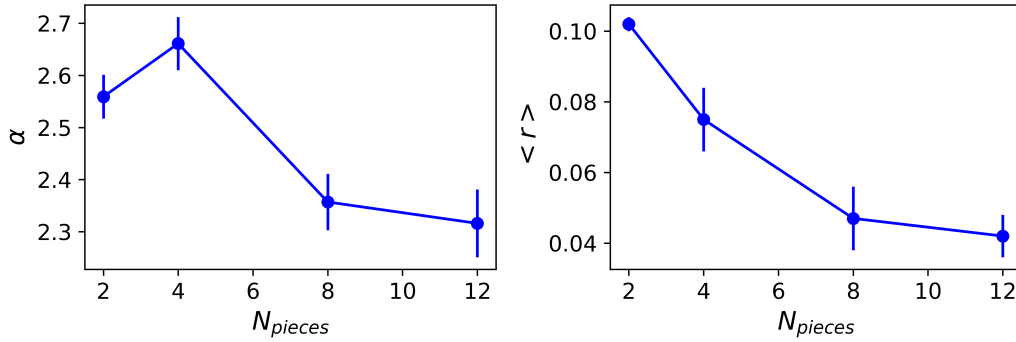

Figure S2: Dependence of the power law slope α (left panel) and the mean radius $\langle r \rangle$ (right panel) as a function of the number of fragments N_{pieces} a particle splits into. Parameters as in Fig.1 in the main text.
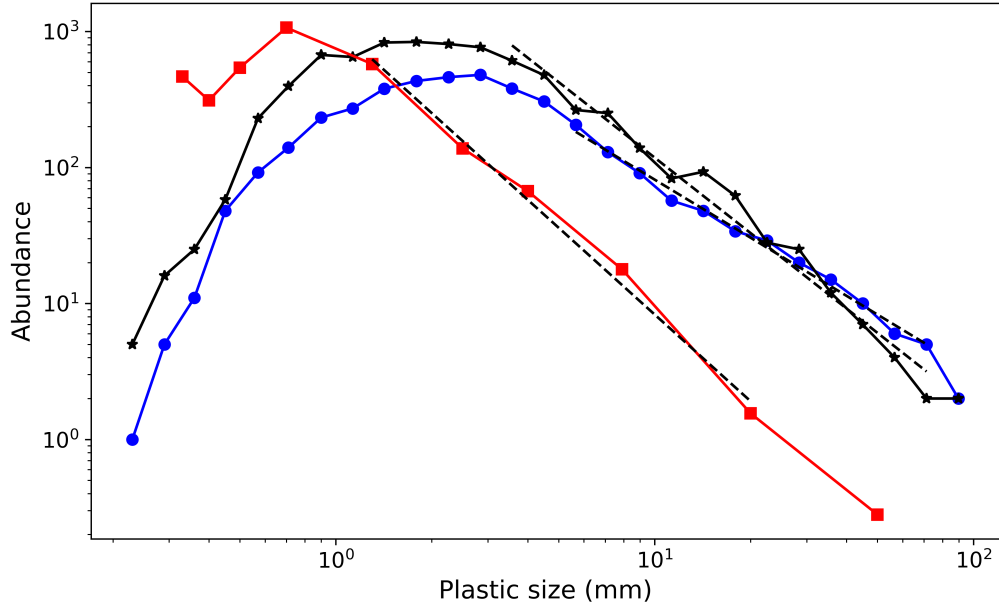
Figure S3: Size distribution of plastic items found in the Mediterranean Sea during the MEDSEA campaign 2013 (blue dots), around the globe during the Malaspina circumnavigation in 2010 (black stars) and around the Balearic Islands (red squares). Dashed lines correspond to fittings to Eq.(1) in the main text using the same procedure as for the model results. Observation data were obtained from the local repositories indicated in the references given in the main text (see Table I).