

Interactive comment on “Electric solar wind sail mass budget model” by P. Janhunen et al.

Anonymous Referee #1

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Obviously a parametric approach was used for the scaling of the space-craft systems. It would be useful for the unfamiliar reader to state as much at the beginning of section 2. A reference to the e.g. SMAD (i.e. the Space Mission and Design Book from Larson & Wertz in whatever appropriate edition) would be helpful as well to justify that approach.

Not all variables for mass or system fraction are explained and/or listed in tables 1, 2 ... or the text which makes the formulae a bit harder to understand.

P433 L16 typo $V_0 = 25, \text{kV}$

P434 L18 should the equation not be $m_{vs} = y_{vy} * P_{eg} / \text{efficiency}$ instead?

Why is the auxiliary tether considered to be rectangular Kapton and not e.g. Kevlar fibres?

$12.7 \mu\text{m}$ Kapton is a pretty rare commodity for manufacturing, handling and availability.

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Interactive Discussion

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Is there a specific technical reason for this e.g. the spooling mechanism of the reel?
What would be the maximum length of an auxiliary tether?

Why a camera for every single tether instead of one single wide angle camera?

Concerning the ACS (AOCS?) it is not stated if the whole spacecraft is spin or 3-Axis stabilised and whether any reaction wheels are to be used. Spin stabilisation would make sense, however, this would have an implication on the payload e.g. camera pointing etc. Can you discuss this a bit in more detail?

Despite the reference to Sepänen et al. could you please include a short description of a Heytether for the completeness of this manuscript

It is usual to have margins (5,10 20%) also on sub-system level plus the overall 20% system margin. It is not clear if this was implemented in this approach.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 2, 429, 2012.

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