

**Comments RC1**

**Response AC1 (corrections)**

---

B) The authors should provide their perspective on the measurement errors. The manuscript frequently reports measurements and errors on the sub-micrometer scale, yet the resolution of a typical optical microscope is limited by the wavelength of visible light ( $\sim 0.38\text{-}0.78\ \mu\text{m}$ ), as described by Abbe's equation, and is typically on the order of a few tenths of a micrometer. Generally, measurement results below  $\sim 1\ \mu\text{m}$  cannot be expected to have reliable accuracy. This is not intended to dismiss the authors' data or arguments entirely, but unless the authors clarify the expected magnitude of errors and the practical limits of their discussion, readers may find it difficult to judge how the results should be interpreted. Furthermore, as noted in some specific comments below, discussions that clearly exceed the optical resolution should be avoided.

We included  $1\sigma$ -errors in Tables 1 and 3, and where errors can be estimated by error propagation.

We explained in answer to a similar comment of reviewer #2, that whereas diffraction broadens a line to a band of  $\sim 0.3\ \mu\text{m}$  width (see Figures 2 and 4), the simple expedient of skeletonization permits to reduce however many pixels that this corresponds to in a digital image to a one-pixel backbone. We believe that this may be the most convincing argument.

**L77-79** : The authors should provide the values of the errors for  $d_D$  and  $d_S$  measurements, or at least their perspective on error estimation and measurement limits. Considering the errors in  $D_{par}$  shown in Tables 2 and 5, these values should also have an approximate standard deviation of  $\sim 10\%$ . Furthermore, for the 20s data in particular, it is possible that some measurements are too small relative to the resolution of an optical microscope.

We cited  $1\sigma$ -errors wherever possible, except where reliable values are too difficult to compute. Given that the errors on the means are  $\ll 0.1\ \mu\text{m}$ , those on the derived quantities are in the  $\sim 1\%$ -range. We believe that more precise estimates are not needed for our work.

We performed bootstrapping of the 20-s data in order to estimate the precision of the  $l$ -axis intercept of a geometric mean regression line anchored at  $D_{par}$ ; this confirmed our estimate:  $<1\%$  at  $1\sigma$ .

**L114-115** : Explicitly present the equation used to calculate  $l_E$ . Since this paper contains various similar parameters that may be confusing, it might be helpful to include a new table summarizing the definitions, symbols, and equations of the frequently used key parameters.

Figure 3a, and its caption explain how the  $l_E$ -values are calculated. It involves determining the intersection point of a vertical line at  $l_M$  (dotted) with the next regression line, and the intersection of a line through that point, and slope  $v_T$  (dashed), with the horizontal axis. That requires simple geometric equations with no direct relationship with our subject. All our calculations can be verified when we have made our data available.

**L209-212** : This statement and the following discussions (L212-235) may be an over-interpretation. It is difficult to discuss this level of precision with the resolution of an optical microscope (generally  $>\sim 0.2\ \mu\text{m}$ ). Even if we assume there is no issue with resolution, using mean values for comparison, the relative magnitudes do not show a distinct trend. Furthermore, the four  $D_{par}$  values overlap within 1sd (Table 2), so the differences cannot be considered significant, whether using the mean or the median.

Correction. The median  $D_{par}$ 's are more robust central estimates than their means. The difference between 21-2 and 21-3 is  $\sim 5\%$  (not 6%), or six standard deviations ( $<1\%$ ). We performed an error propagation where possible, and cited the relevant results with their  $1\sigma$ -errors.

**L249-252, 257-258** : Given the limitations of measurement accuracy, this discussion might be overstretched.

We deleted Table 4 and rewrote the corresponding sections, referring to Figures S07, S08 and S09. As the intercepts and slopes in Table 4 are over-, resp. underestimates, their actual values are of no real interest. We reframed the discussion based on the absolute differences  $\Delta(v_T)$  and  $\Delta(t_E)$ , explaining the statistical consequences of the manner of their calculation and indicating the extent to which they might be underestimated. This somewhat weakens our conclusion that the effects  $i_P$ ,  $t_E$  and  $v_T$  can be ignored but it remains the case that corrections would have a minimal effect in real-

---

---

world applications.

---

**Table 4** : The data from "DULU" is not used in the main text. The corresponding data are presented in Figures S15-16; however, they do not seem to be cited or discussed in the main text.

We deleted Table 4, and added a discussion, referring to Supplement Figures S15 and S16 instead.

---

**Supplementary files** : Except for Figures S07-S09, the other supplementary figures are not mentioned at all in the main text, making it difficult to understand the purpose of the data. For example, Figures S01-S02 and S05-S06 could be cited in the caption of Table 2, or otherwise linked explicitly to the relevant data or discussion in the main text.

We consider these supplements as optional, i.e., for readers who desire a closer look. We therefore mentioned them, in toto, at the end of our introduction. We have inserted references to Figures S15 and S16, which refer to data not plotted in a different form in the text.

---

Sincerely,  
R. Jonckheere  
F. Trilsch  
Jie Liu  
Pengfei Zhai  
T. Nagel