Sir,

Spectral and time domain OCT measure identical retinal thickness if identical boundaries are selected for analysis

We read with interest an article by Forte *et al*[1] in the December issue of *Eye*, which showed good correlation between the time-domain Stratus OCT and the spectral domain SLO/OCT, but significantly higher retinal thickness measurements with the latter. Similar findings have recently been showed when comparing the Stratus with the Topcon 3D-OCT 1000,[2] and Zeiss Cirrus OCT.[3]

One critical aspect of thickness determination that is well recognized, but not addressed by the authors of any of the above articles, is that the selection of anatomical structure as the outer boundary for thickness measurement. Several candidate hyper-reflective lines are created by (1) the inner segment (IS)/outer segment (OS) junction, which the Stratus uses by default, (2) the internal aspect of the RPE, and (3) Bruch's membrane. Here, we would like to illustrate this, by comparing the Stratus measurements with the spectral domain Topcon 3D-OCT 1000, which allows the user to choose any of the above three structures for thickness determination. Briefly, 26 normal retinas were imaged using the automatic software algorithms provided by the respective manufacturer. We found that measurements correlated well between Stratus and 3D-OCT if identical boundaries were used. Average ILM-IS/OS measurements were essentially identical on the two instruments: $250 \pm 39\,\mu$m (Stratus), and $251 \pm 39\,\mu$m (3D-OCT). Measurements using the inner aspect of the RPE or Bruch's membrane (BM) yielded results that were greater by an average of 17 ± 8 and $58 \pm 9\,\mu$m, respectively. As shown in the Figure 1, and as shown by Forte *et al*[1] for their instrument, there was a linear relationship between measurements obtained with both machines (goodness of fit $r^2 = 0.9957$), and values correlated well over the whole range of thicknesses (Pearson's coefficient $r = 0.9957$).

In summary, if the appropriate boundaries for thickness determination were used, the older generation, time-domain Stratus OCT measurements were essentially identical to those obtained with the latest generation spectral domain Topcon 3D-OCT 1000. When interpreting retinal thickness with OCT instruments of different generations and manufacturers, measurements will vary depending on the anatomical layers delineated by each instrument, and correlation between different devices should be considered in clinical and study assessment.

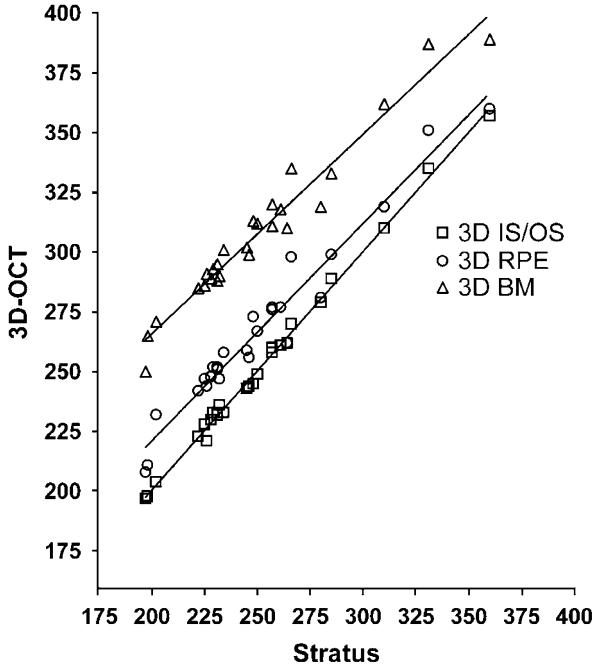

Figure 1 As shown by Forte *et al*[1] for the S-SLO/OCT, there was a linear relationship between measurements obtained with the Zeiss Stratus OCT and the Topcon 3D-OCT 1000 (goodness of fit $r^2 = 0.9957$), and values correlated well over the whole range of thicknesses (Pearson's coefficient $r = 0.9957$). Measurements on both instruments yield essentially the same results when the identical outer boundary is chosen on the 3D-OCT. ILM-IS/OS measurements were $250 \pm 39\,\mu$m with the Stratus and $251 \pm 39\,\mu$m with the 3D-OCT (3D-IS/OS). Measurements using the inner aspect of the RPE or BM yielded predictably higher results that were greater by an average of $17 \pm 8\,\mu$m (3D-RPE) and $58 \pm 9\,\mu$m (3D-BM), respectively.

References

1 Forte R, Cennamo GL, Finelli ML, de Crecchio G. Comparison of time domain Stratus OCT and spectral domain SLO/OCT for assessment of macular thickness and volume. *Eye* 2008; **12** [e-pub ahead of print].

2 Leung CK, Cheung CY, Weinreb RN, Lee G, Lin D, Pang CP *et al*. Comparison of macular thickness measurements between time domain and spectral domain optical coherence tomography. *Invest Ophthalmol Vis Sci* 2008; **49**(11): 4893–4897.

3 Kiernan DF, Hariprasad SM, Chin EK, Kiernan CL, Rago J, Mieler WF. Prospective comparison of cirrus and stratus optical coherence tomography for quantifying retinal thickness. *Am J Ophthalmol* 2009; **147**(2): 267–275.e2, (e-pub ahead of print 17 October 2008).

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Sir,

Response to Dr Engelbert *et al*

We highly appreciate the comments of Dr Engelbert *et al* on our recently published article.[1] We agree with the observations made by Dr Engelbert *et al* that the measurement of retinal thickness (RT) with optical coherence tomography (OCT) will vary depending on the outer retinal boundary delineated by each instrument. Therefore, appropriate boundaries for