correction method has several drawbacks. The appearance of small filaments on the 3D plastic phantom′s surface results in some non-uniformity in the results. Using a digital low-pass filter, or smoothing the surface with sand paper could minimize this issue. In circumstances where optical properties of homogeneous objects are of interest, digital filtering is a suitable choice. Whereas with inhomogeneous objects whose small details are sought, filtering may reduce data content, in this case the smoothing of the reference with sand paper is more appropriate. In this study, phantoms were slightly polished to partly minimize the effect of the filament but not to influence the height and structure of the 3D phantoms. Finally, a higher quality 3D printer would dramatically reduce this type of noise.

Another major drawback of this correction method is the lack of ABS plastic at different optical properties; although some printing methods use custom materials, they were not available for our specific printer. Theoretically in SFDI, any diffuse material can be used as a reference to calculate optical properties. However, it has been shown that the closer the optical properties of the reference are to the one of the measured object, the better the results. Furthermore making physical phantoms for calibration is time-consuming and may not be suitable for all clinical applications. Nevertheless we believe this technique offers a direct calibration method that is applicable to many laboratory scenarios, particularly when the calibration and validation of a clinical instrument is performed. The proposed method is also applicable to non-uniform objects due to the achievements of 3D imaging on variety of materials (such as conch shell, circuit board, and human body) [23] as well as SFDI *in-vivo* tests [11,24]. Improvement in imaging speed can be easily implemented both for SFDI and 3D reconstruction. The frequencies used for 3D reconstruction can be combined with the frequencies used for SFDI to obtain different penetration depths. Moreover, in the case of dynamic targets, multi-frames of each image could be recorded and ultimately the effect of movements artifact such as the one due to breathing could be corrected.

In future work we plan to study non-uniform objects as well as developing methodologies to generate 3D phantoms with different optical properties.

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