Figure 17: IBR subjective evaluation. (a-c) Desk light field interpolation using (a) Proposed layer-based representation, (b) stereo matching algorithm [36] and (c) EPI tubes extraction method [37]. (d-f) Dwarves EPI interpolated images in the same order. Note that the layer extraction algorithm has been implemented on the grayscale images. The obtained layers were then used to interpolate each of the RGB channels to show colour results.

6 Conclusion

We presented a novel method to obtain a sparse representation of multiview images. The fundamental component of the algorithm is the layer-based representation, which partitions the multiview images into a set of layers each related to a constant depth in the scene. We presented a novel method to obtain the layer-based representation using a general segmentation framework which takes into account the structure of multiview data to achieve accurate results. The obtained layers are then decomposed using a 4D DWT applied first across the viewing and then the image dimensions. We modify the viewpoint transform to efficiently deal with occlusions and depth variations. Simulation results based on nonlinear approximation have shown that the sparsity of our representation is superior to a multi-dimensional DWT with the same decomposition structure without disparity compensation. In addition we have shown that the proposed representation can be used to efficiently synthesise novel viewpoints for IBR applications and also de-noise multiview images in the presence of AWGN.