Rotation Averaging in a Split Second: A Primal-Dual Method and a Closed-Form for Cycle Graphs

Supplemental Material

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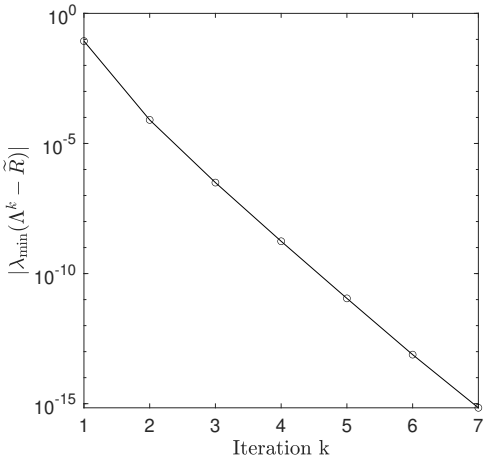
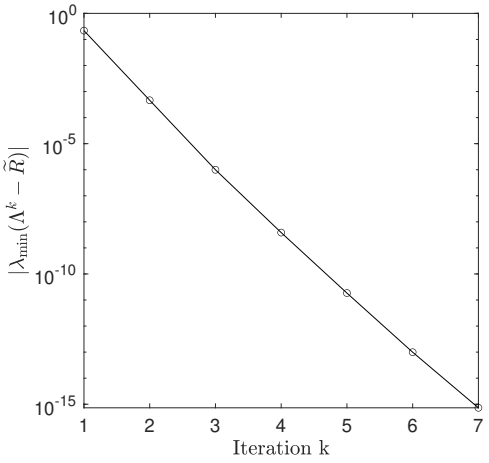
A. Convergence plots

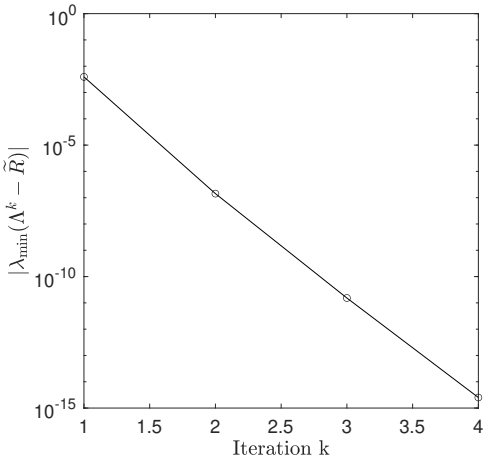
We provide in this section plots showing the convergence of our primal-dual method (RAveSS) in six of the datasets evaluated in Section 6.1 (Table 1). Recall that if $(\Lambda^* - \widetilde{R})R^* = 0$ and $\Lambda^* - \widetilde{R} \succeq 0$, the primal-dual pair (R^*, Λ^*) is globally optimal. In the six plots of Fig. 5 we can observe the smallest eigenvalue of $\Lambda^k - \widetilde{R}$ converging to zero.



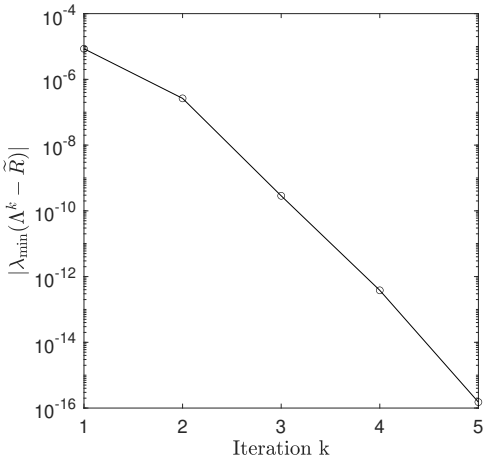
(a) smallGrid3D (n=125). Time/iteration: 0.005s.



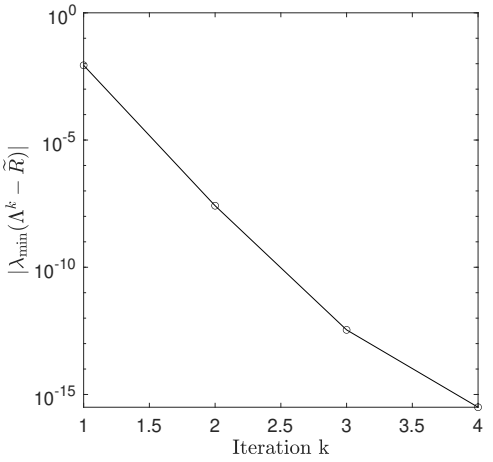
(b) Sphere (n=2200). Time/iteration: 0.07s.



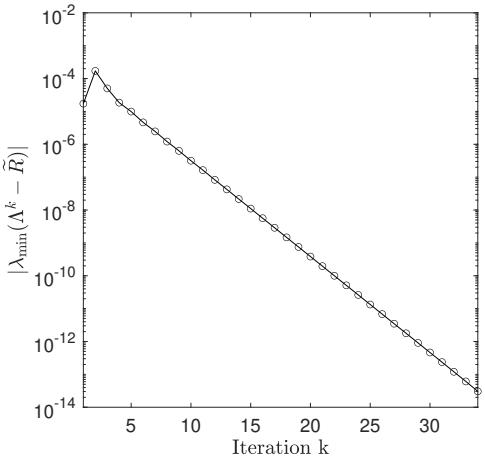
(c) Torus3D (n=5000). Time/iteration: 0.12s.



(d) Cubicle (n=5750). Time/iteration: 0.11s



(e) Grid3D (n=8000). Time/iteration: 0.48s



(f) Rim (n=10195). Time/iteration: 0.2s

Figure 5: Convergence of the smallest eigenvalue of $\Lambda^k - \widetilde{R}$ per iteration k of RAveSS.