Paper Peer Review

"Optimal Approximation of Power Flow Problem"

1. Summary

The paper discussed is focused on optimization of workload in the energy network. Consistently with the author I admit that each improvement can lead to significant financial profits. In the paper different types of connections were shown and many options introduced for system operator to control. Main idea is represented in division of problem to 8 sub-problems and then applying trust region approach. Algorithm of effective border search is introduced and tested on synthetic and real data.

2. Advantages

+ Problem importance is huge
+ Lots of different parameters introduced
+ Different types of nodes are considered along with shunting and generation modes modelling
+ Informative and inspiring pictures of working border search
+ Good complexity analysis, very significant time improvement (up to 2619 times)
+ No contradiction in notation and good coherence

3. Disadvantages

– Just two-dimensional examples introduced (that's of course good for visualization), but it's not still clear how good the approach is on big-dimensional data
– I didn't catch in the paper why the objective convergence plot was built using only optimal border points. Is the fact, that points inside are not appropriate, the reason?
– I needed much time to understand in your code how example shape is obtained. It is seen in the paper, maybe it is a good idea to add the figure 10 to .ipynb? Better also to add documentation to functions if you have time.
– Mix of Russian and English is strange to interpret. Moreover you have some misprints. Do not know if construction $n/timesn$ is typo, but I don't see another way to understand it.
– It is stated that values of p_g, q_g are in Fig.2, but they appear first in Fig.6, that's confusing.
– In s_d^i, s_g^i etc. it is not clear what is j. I personally prefer decoding of notation in formulas in a way you've done it on page 7.

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