Some Notes on Discussions during Günther's and Raphael's visit to Ostrava

Günther Of

September 5, 2019

- Honza, Günther: mini-symposium?
- Honza, Günther: mobility, why A1 form? self-employment or not? taxes and social insurance in CZ?
- Honza, Günther: test cubature for two general elements with source partially in the future
- Honza, Günther: check if Duffy is required for initial potential (techniques by Hüeber, Tausch)
- Günther: review some ideas on preconditioning
- Günther: makefile
- Günther: Intel compiler 19.04 and new system for new computer
- pFMM:
  - Raphael: FGT operations etc for the pFMM (to be optimized later)
  - Michal: complete cluster implementation; stop subdivisioning by number of elements in the box; we need padding and position of the children
  - Michal and Raphael: initial implementation of pFMM, maybe without space-time clusters, i.e. traverse temporal tree and pick spatial level
  - later transition to space-time clusters (required for adaptivity); pFMM algorithm has to be changed (see animation); create space-time cluster tree driving the pFMM directly; a first guess on the criterion (enables kernel approximation):
    $$c_1 h_x^2 \leq h_t \leq c_2 h_x^2$$
    The related list of partners/operations may be create similarily to the nearfield.
  - Michal and Raphael: discussion of data structures and interfaces for pFMM

  - data structure containing nearfield matrix and farfield structures?
  - pFMM: based on lists or tree?
  - Raphael, Michal: find error/difference in Matlab code
- create some notes on basic math, algorithm and operations
- Raphael: test pFMM for non-uniform time stepping and the sphere in the Matlab code → talk in Söllerhaus
- Raphael, Günther: compare adaptive idea with nearfield treatment by Tausch and Messner.
- Raphael, Günther: develop ideas on pFMM for different spatial meshes during uniform time stepping
- Travel plans:
  - Söllerhaus
  - Michal and Honza: November 11-14
  - Raphael: if necessary at short notice