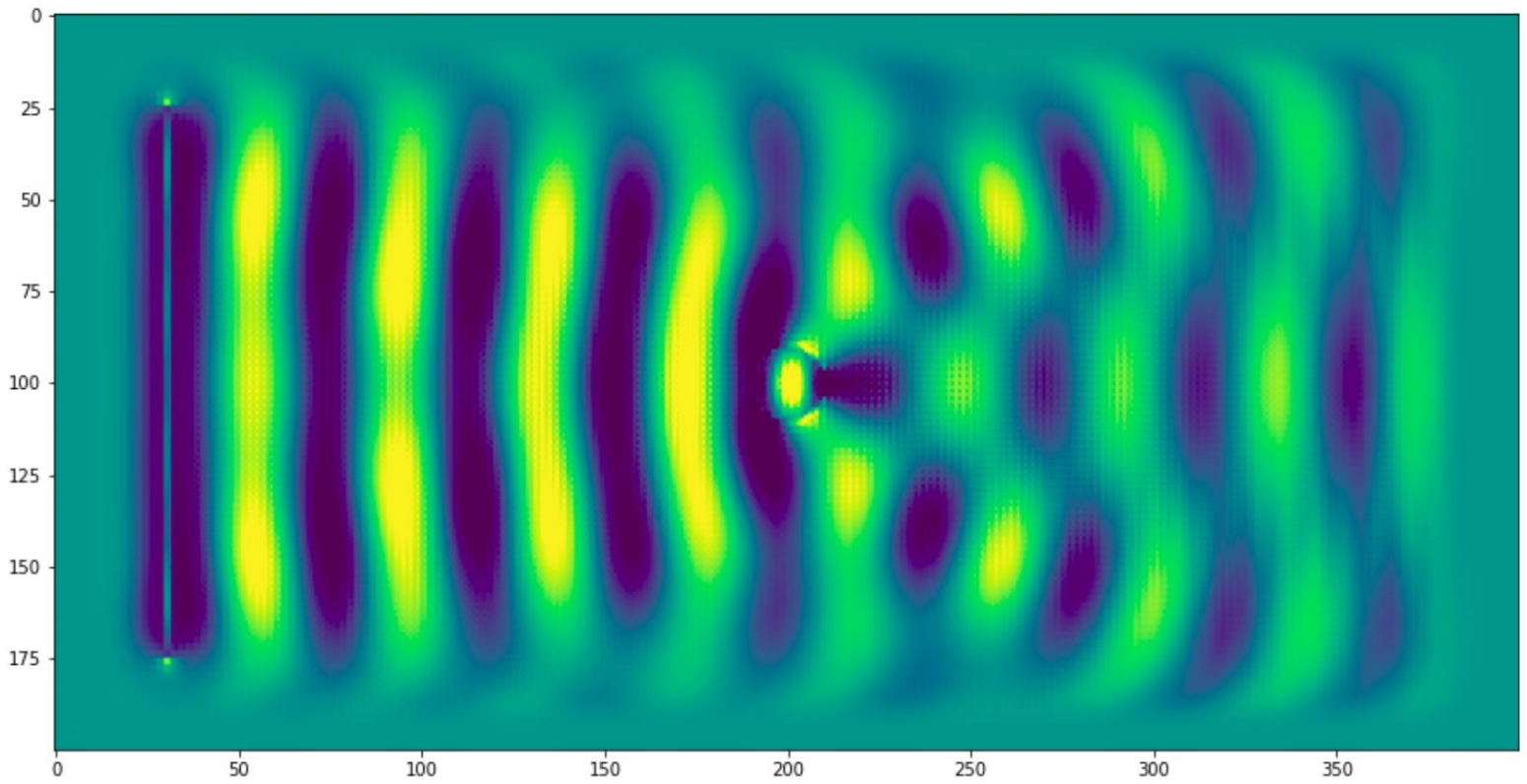
Seminar 4

HPC 2021

Problem: solving Maxwell equation 2d



Iterations:
1) solve on CPU
2) add OpenMP to the CPU solution
3) convert solver to class
4) implement GPU solver using class
5) introduce OpenGL

$$
\begin{aligned}
\varepsilon \partial_t E_x &= \partial_y H_z, \\
\varepsilon \partial_t E_y &= -\partial_x H_z, \\
\mu \partial_t H_z &= \partial_y E_x - \partial_x E_y.
\end{aligned}
$$

Next GPU related seminars

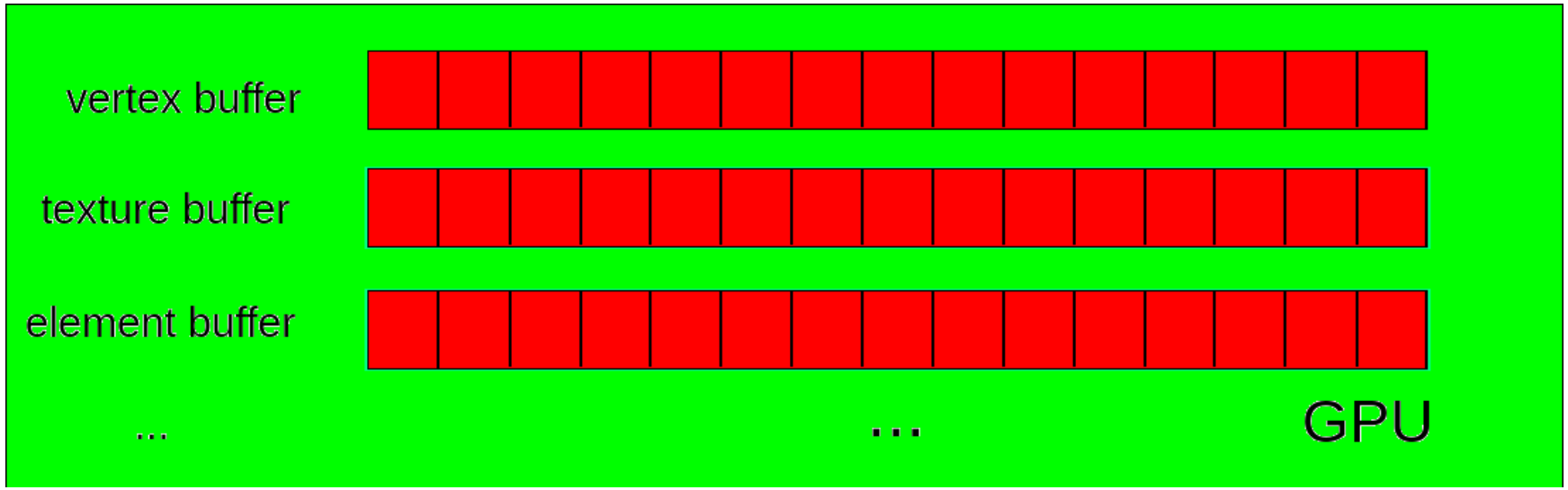
Next seminars follow on the Maxwell solver:

- Seminar 5:
  - try to add cudaStreams;
  - try to add shared memory;
  - look at nvprof and nvvp.
- Seminar 6:
  - try to add multi-GPU computations;
  - try to add hybrid CPU+GPU computations.

Seminar on GPU Libraries:

- Seminar 7:
  - CuDNN;
  - ???

OpenGL buffered objects



1) create different buffered objects from data
2) put them on GPU
3) tell OpenGL how to interpret the buffered objects
4) call drawing routines