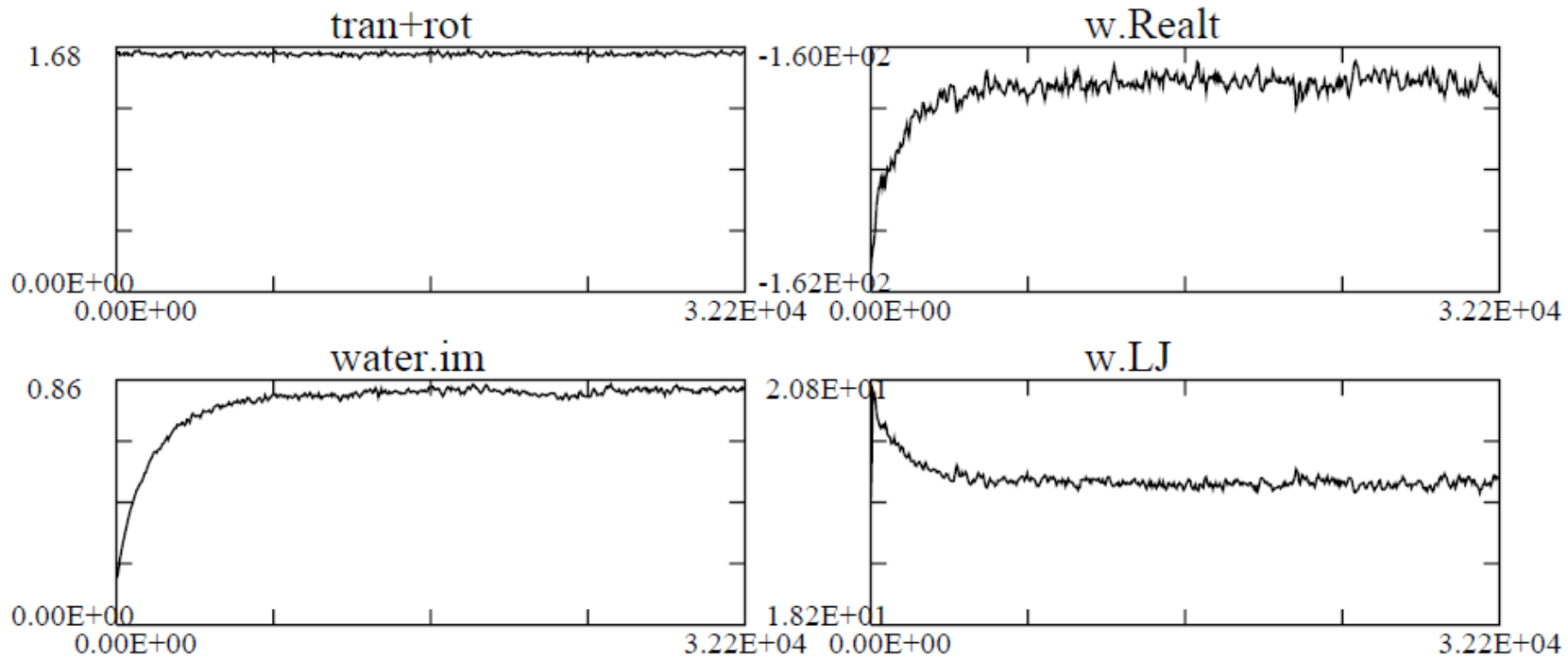


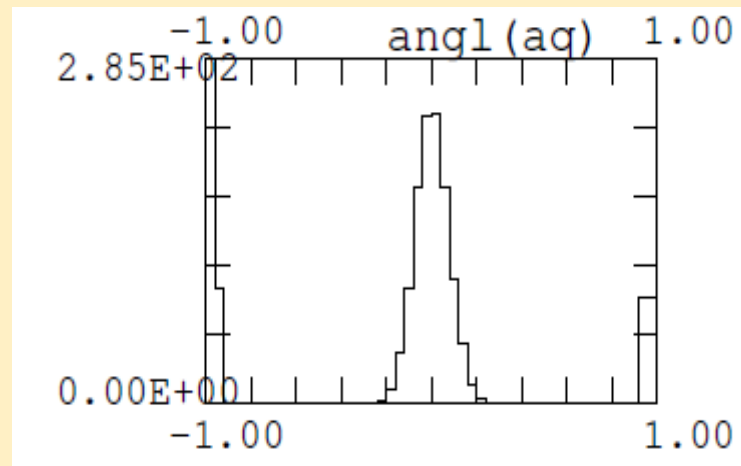
*Figures - Molecular dynamics simulation
of water and ice by TIP5P code*

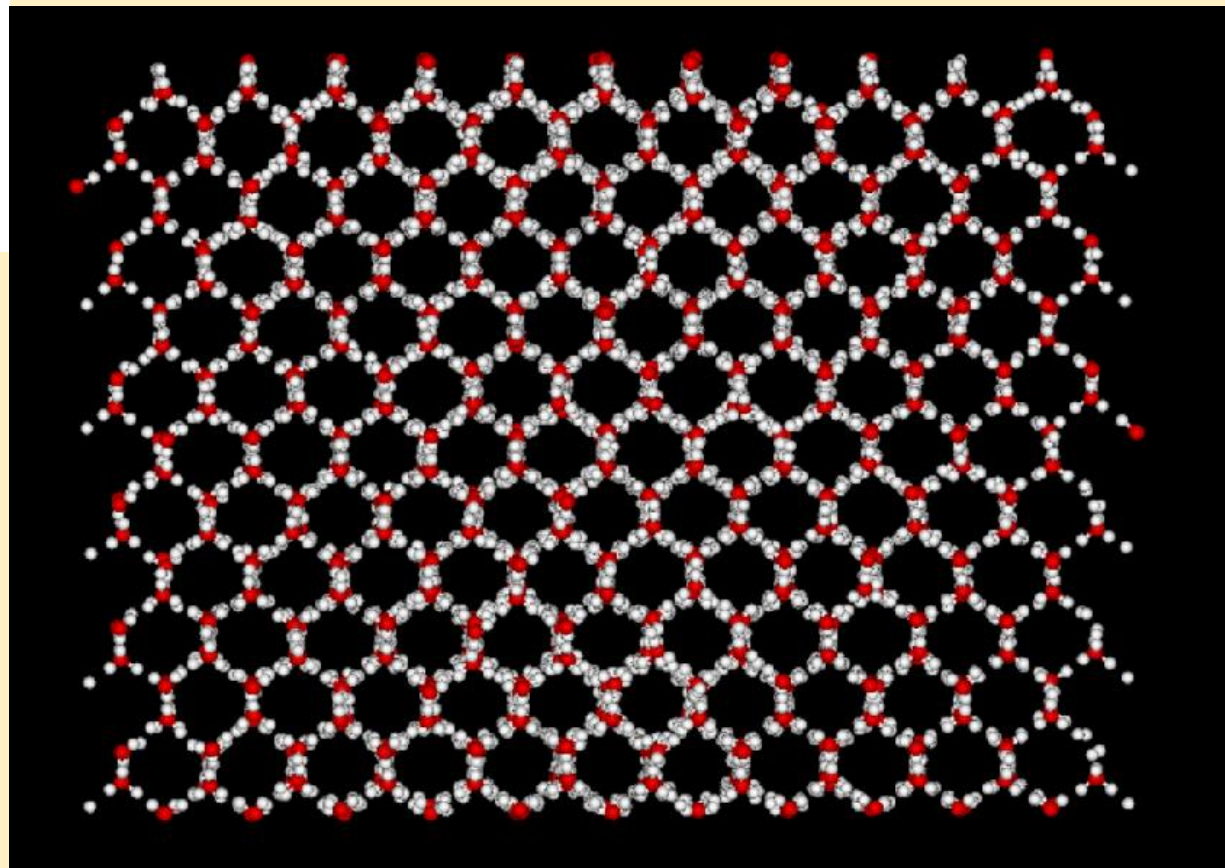
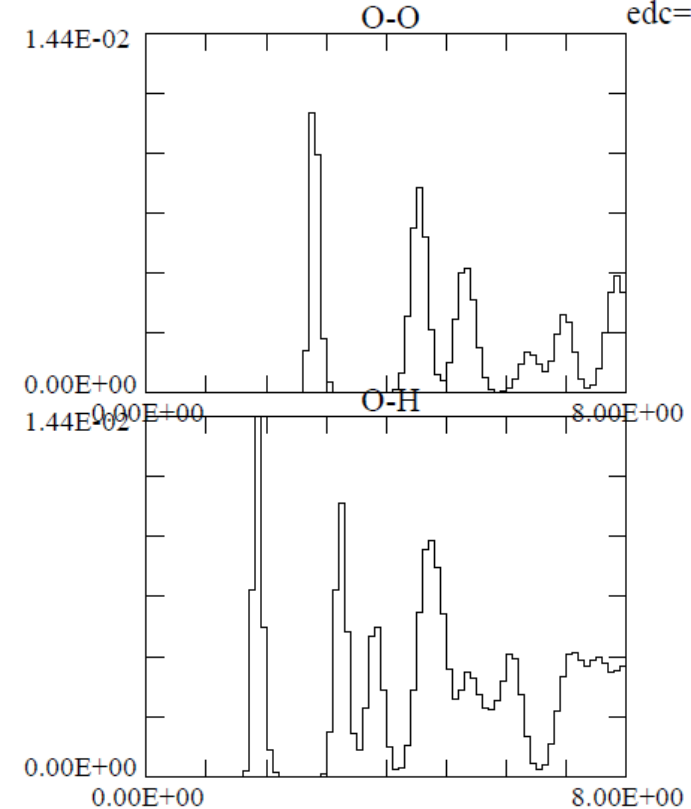
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Simulation starting from ice at 230 K

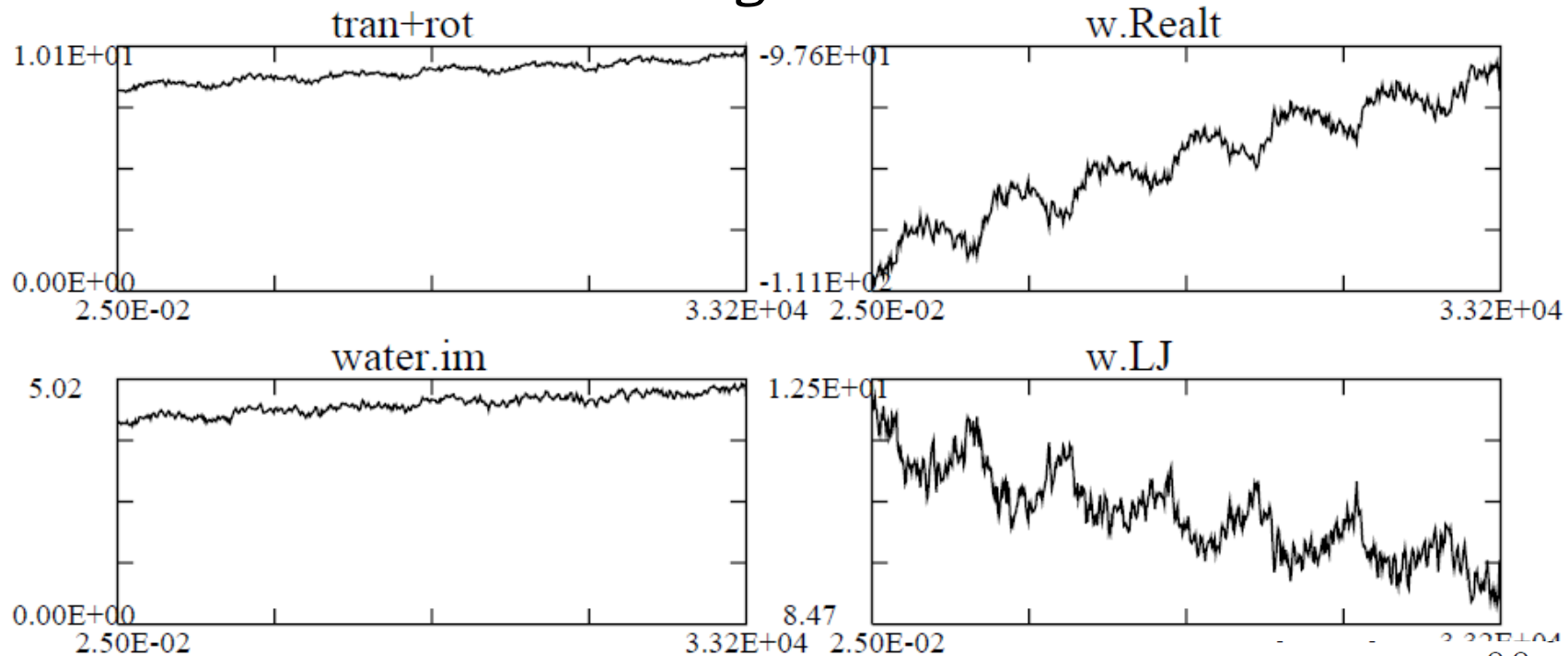


At temperature 230 K of 1728 water molecules, AC electric field 10 GHz in the x-direction with intensity $E_0 = 10 \times 10^6$ V/cm. Left: a) total kinetic energy, b) rotational energy only, c) Coulombic energy, d) Lennard-Jones energy, at time of $t=32,200$. Right: cosine distribution of water in the x-direction. No oscillations are really found at imposed large electric field.





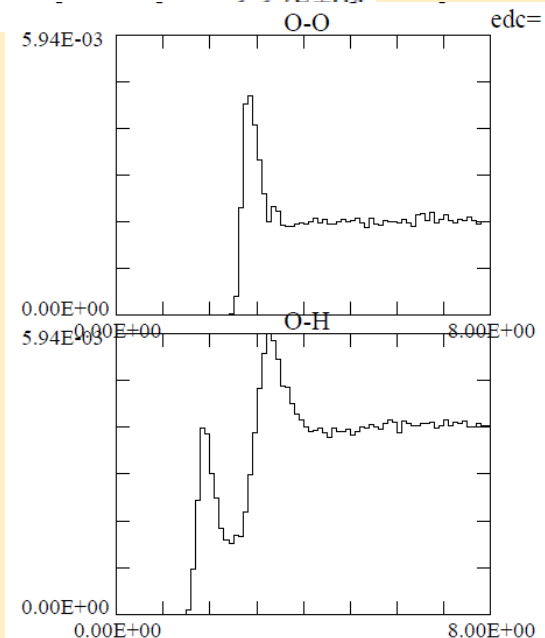
Simulation water starting from 298 K

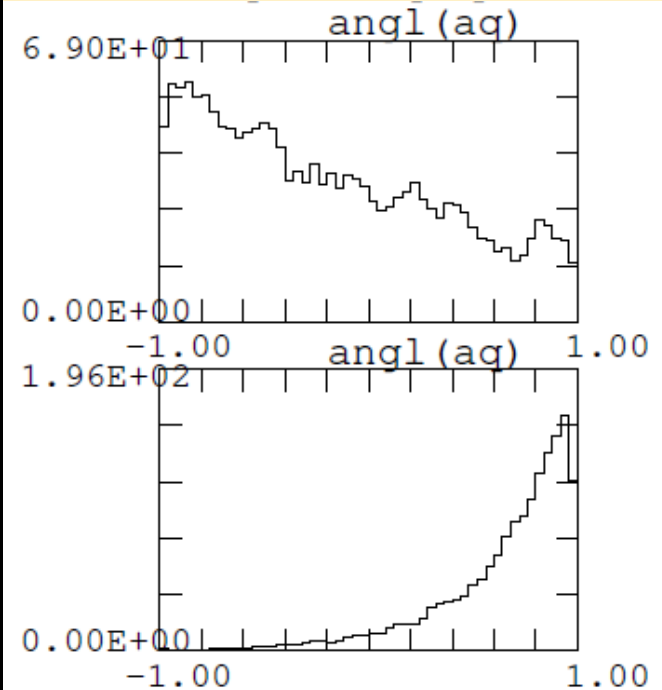
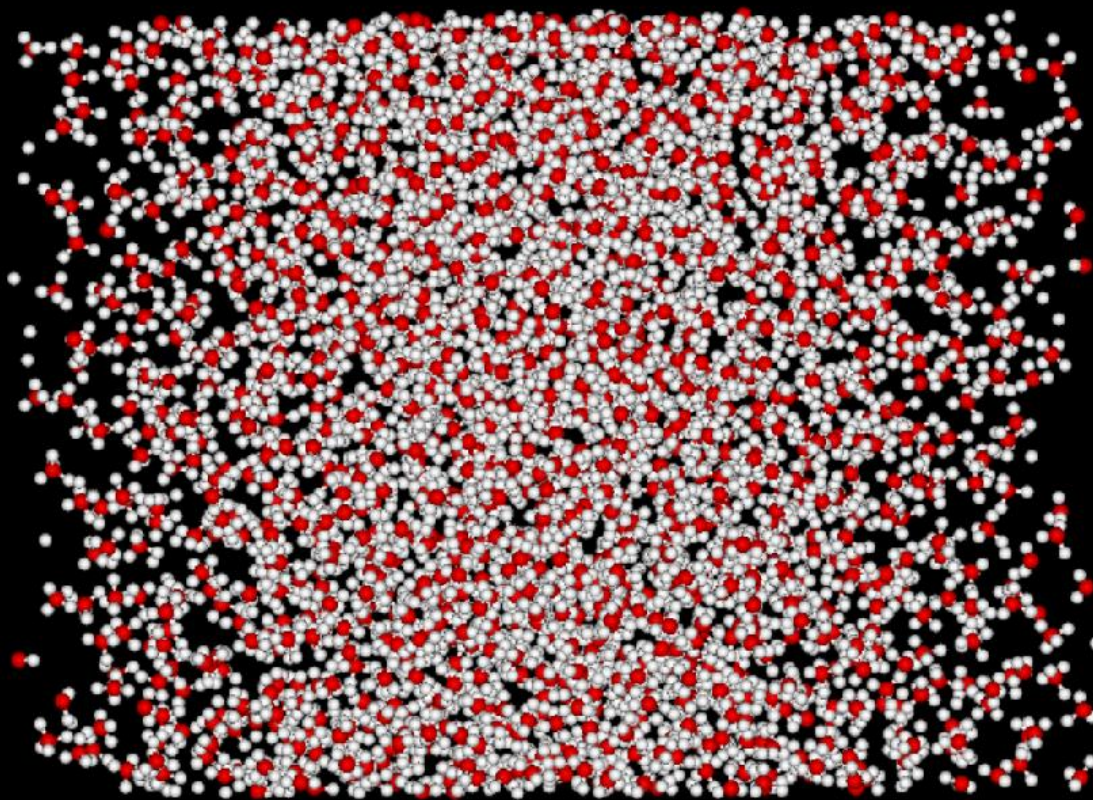


Time $t=33,200$ starting from 298 K with 1728 water molecules, imposed electric field 10 GHz in x-direction with $E_0 = 5 \times 10^6$ V/cm (about 3.2 periods).

Left: a) total kinetic energy, b) rotational energy only, c) Coulombic energy, Lennard-Jones energy.

Right: pair distribution functions of a) O-O atoms, b) O-H atoms in $R=0-8$ Angstrom. O and H atoms are thus mixed showing heavy water interactions. Compare with the frozen ice of 230 K.





At $t=33,000$ of water molecules at 298 K.

Left: scatter plot of water, b) x-directional cosine distribution for the cross bins in $(-1.0, 1.0)$. Due to phase lag of molecules compared to imposed electric field, water is largely heated,