**Crystals for Optical Quantum Memory**

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The title of my talk is the same as the title of our joint Project with Taiwanese colleagues, supported by the Russian Foundation for Basic Research (RFBR) from the Russian part and by the Ministry of Science and Technology (MOST), Taiwan. Mitch M.-C. Chou is Taiwanese Principal Investigator, he is responsible for the crystal growth and characterization by different X-ray and microscopy methods. I am Russian Principal Investigator and in addition to my group, two groups from Kazan’ are involved into the Project. Gilman Shakurov from Zavoisky Physical-Technical Institute characterizes the crystals by EPR methods but the group of Sergei Moiseev carries out photon-echo experiments and measures coherence times of hyperfine levels selected to build a three-level system for optical quantum memory.

In my talk, I’ll briefly discuss the following points:

* Quantum informatics: quantum bits (qubits), quantum memory, quantum computer;
* Three-level Λ and V systems for optical quantum memory;
* systems based on hyperfine levels of impurity centers in crystals;
* Requirements for crystals for optical quantum memory;
* A list of promising crystals;
* Several examples of our research [1-3].

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References

1. M. N. Popova, *Materials for optical memory: Resolved hyperfine structure in KY3F10:Ho3+.* Optical Materials, **35**, 1842 (2013).

2. M.N. Popova, *Resolved hyperfine structure in the spectra of crystals for optical quantum memory*, European Physical Journal Conferences **103,** 01011 (2015).

3. M.N. Popova, K.N. Boldyrev, *High-resolution spectra of LiYF4:Ho3+ in a magnetic field,* Optical Materials **63**, 101 (2017).