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Sub-Wavelength Lithography Using Nitrogen-Vacancy Color Centers in Diamond FAHAD ALGHANNAM, Institute for Quantum Studies and Department of Physics and Astronomy, Texas A&M University, College Station, Texas 77843-4242, USA, PHILIP HEMMER, Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX 77843, USA, ZEYANG LIAO, Institute for Quantum Studies and Department of Physics and Astronomy, Texas A&M University, College Station, Texas 77843-4242, USA, MOHAMMAD AL-AMRI, he National Center for Mathematics and Physics, KACST, P.O. Box 6086, Riyadh 11442, Saudi Arabia, M. SUHAIL ZUBAIRY, Institute for Quantum Studies and Department of Physics and Astronomy, Texas A&M University, College Station, Texas 77843-4242, USA — In classical optical lithography, resolution is limited to about half of the wavelength of the source used in the process. However, as we reach high frequencies (Deep UV or X-ray), several problems and difficulties occur. Over the last decade, several techniques were suggested to go beyond the classical limit. In 2010, Liao, Alamri, and Zubairy proposed a method using two lasers with different frequencies; one is used to induce Rabi oscillations between two states and the other is used to excite the ground state to a third state, thus writing the lithography pattern. In this presentation I will talk about an experimental approach to implement their method of sub-wavelength lithography using optical and magnetic properties of NV color centers in diamond.

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