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Sommario/riassunto	This thesis presents a novel approach to the experimental realization of tunable, superconducting metamaterials. Therefore, conventional resonant meta-atoms are replaced by meta-atoms that contain Josephson junctions, which renders their resonance frequency tunable by an external magnetic field. This tunability is theoretically and experimentally investigated in one-dimensional magnetic and electric metamaterials. For the magnetic metamaterial, the effective, magnetic permeability is determined.