Topological Superfluid in P-band Optical Lattice\textsuperscript{1} YA-JIE WU, JING HE, CHUN-LI ZANG, SU-PENG KOU, Department of physics, Beijing Normal University, CONDENSED MATTER PHYSICS GROUP TEAM — By studying p-band fermionic system with nearest neighbor attractive interaction we find translation symmetry protected $Z_2$ topological superfluid (TSF) that is characterized by a special fermion parity pattern at high symmetry points in momentum space $k = (0, 0), (0, \pi), (\pi, 0), (\pi, \pi)$. Such $Z_2$ TSF supports the robust Majorana edge modes and a new type of low energy excitation - (supersymmetric) $Z_2$ link-excitation.

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