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Self-Trapping and Binding of Particles from Singular Pockets in the AFM Mott Insulator State of Cuprates ALVARO ROJO BRAVO, SERGUEI BRAZOVSKI, Laboratoire de Physique Theorique et Modeles Statistique — We study theoretically the formation of quasi-particules due to interactions with impurities and gap distortions in the insulating phase in a antiferromagnetic Mott insulator. Wave functions for single particles are distorted by interactions with collective modes as local distortions of the insulating gap or impurities, as shown by the experimental data. This effects give place to the apparition of bound sates which lower the total particle energy below the nominal level of the insulating gap. This features take a special importance in the lightly electron-doped materials, where the van Hove singularity (vHS) at the anti-nodal points $(\pi, 0)$ of the Brillouin zone, plays a major role in enhancing the effective mass of these bound states and in the self-localization through local distortion of the gap.

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