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Modulation of Optical Lattice Potential in a Fermionic Mott Insulator RAJDEEP SENSARMA, DAVID PEKKER, EUGENE DEMLER, Harvard University — We analyze the double occupancies produced in a Fermionic Mott insulator near half-filling by modulating the optical lattice potential. We relate the rate of production of doublons to the spectral function of a hole and a doublon in the background of the spins. In the high temperature (spin disordered) state, the hole (doublon) is completely incoherent and the rate of production of doublons is peaked around $\omega = U$ and decreases montonically upto twice the bandwidth on either side. We also derive a sum-rule for energy integrated response in this limit. At low temperatures (anti-ferromagnetically ordered state), the spin ordering leads to a coherent peak in the hole spectral function along with other broad features corresponding to shake-off of spin-waves. This shows up in the doublon production rate as a sharp edge at the lower end of the spectrum and oscillations as a function of perturbing frequency.

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