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Orbital Resonance Mode in Superconducting Iron Pnictides WEI-CHENG LEE, PHILIP PHILLIPS, University of Illinois at Urbana-Champaign — We show that the fluctuations associated with ferro orbital order in the d_{xz} and d_{yz} orbitals can develop a sharp resonance mode in the superconducting state with a nodeless gap on the Fermi surface. This orbital resonance mode appears below the particle-hole continuum and is analogous to the magnetic resonance mode found in various unconventional superconductors. If the pairing symmetry is $s_{\pm}$, a dynamical coupling between the orbital ordering and the d-wave subdominant pairing channels is present by symmetry. Therefore the nature of the resonance mode depends on the relative strengths of the fluctuations in these two channels, which could vary significantly for different families of the iron based superconductors. The application of our theory to a recent observation of a new δ -function-like peak in the B_{1g} Raman spectrum of $Ba_{0.6}K_{0.4}Fe_2As_2$ is discussed.

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