The Abdus Salam
International Centre for Theoretical Physics

United Nations Educational, Scientific and Cultural Organization
IAEA International Atomic Energy Agency

Conference on Research Frontiers in Ultra-Cold Atoms
ICTP, Trieste, 4 - 8 May 2009

Theory of Radio-Frequency Spectroscopy in Ultra-cold Fermi Atoms

G.C. STRINATI
Universita' degli Studi di Camerino, Dipt. di Fisica, Camerino, Italy

Abstract:

Radio-frequency (RF) spectroscopy represents a powerful tool to probe the correlated state of a system of ultracold Fermi atoms throughout the BCS-BEC crossover, for which the evolution from the BCS limit of Cooper pairs to the BEC limit of composite bosons is driven by a Fano-Feshbach resonance. Several sets of data have been collected for Li6 with this perspective, in various regimes of temperature and coupling. Purpose of this talk is to present an overview of the theoretical interpretations of these spectra based on a many-body diagrammatic approach, which extends from the broken-symmetry phase below the superfluid critical temperature to the normal phase above it. Features of these spectra, which identify the correlated aspects of the many-body system, will be evidenced and discussed in detail.