state can occur in which the quasi particles form a domain wall with the order parameter Δ changing sign across the wall. The quasi particles are bound to the domain wall. We have carried out self consistent solutions of the Bogoliukov-de Gennes equations which exhibit these novel properties. M. I. Salkola and J. R. Schrieffer, submitted for publication.

5) We have studied the physical origin of two effects in the ARPES spectrum of strongly correlated electron systems, shadow bands and three peak spectra. Shadow bands are due to exchange Bragg scattering from strong antiferromagnetic spin fluctuation which persist into the paramagnetic phase of strongly correlated materials. Three peak spectra arise as a superposition of the antiferromagnitic split bands smeared by the finite correlation length of the spin fluctuations plus the residual peak of the Landau quasi particle. The presence of the Landau peak is due to time averaging of the exchange scattering potential for low energy excitations. This effect leads to anomalous dispersion of the self energy for energies smaller than the characteristic spin fluctuation energy. This work lead to the papers A. P. Kampf and J. R. Schrieffer, J. Phys. Chem. Sol. 56, 12, 1673 (1995) and Proceedings of Physical Phenomena in High Magnetic Fields II, P. 609 (1996) World Scientific.

II. Other Current Federal Support

M. A. Novotny - NSF CARM-95 program (Computational Aspects of Real Materials) "Computational Studies of Dynamical Phenomena in Nanoscale Ferromagnets" (with Per Arne Rikvold) $434,000.00 for August 1995-August 1998. (FY96 for $217,000.00)

J. R. Schrieffer - NSF DMR96-29987, "Theory of Strongly Correlated Electron Systems" $405,000, 7/1/96 - 6/30/99

III. Personnel associated with the grant:

L. P. Gor'kov
M. A. Novotny
J. R. Schrieffer
J. H. Kim
A. P. Kampf
G. Buendía
W. O. Putikka
Z. N. C. Ha

IV. Funds Unexpended $ 5,236