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설명 1-2.

Short-range Correlation Effect in the Electron Gas.

JONGBAE HONG and DO YOUNG KIM(Seoul National University). The effects of short-range correlations on the dynamical properties of the electron gas are studied by extracting large-momentum transfer terms from static susceptibilities. The relaxation function involving only short-range correlations is obtained analytically by calculating infinite continued fraction. The peaks of our dynamical form factors agree with experiments, performed by Flatzman and Eisenberger, better than any previous theoretical predictions. The f-sum rule is considered. The sum rule provides how much dominant the short-range correlation is in a particular momentum transfer case.

1. K. Bedell and G. E. Brown, Phys. Rev. B17, 4512(1978)
2. H. DeRaedt and B. DeRaedt, Phys. Rev. B18, 2039(1978)

* 이 연구는 한국과학재단의 도움을 받았음.

설명 1-3.

Relative Role of Long-range and Short-range Correlations in the Electron

Gas. JONGBAE HONG(Seoul National University). On the basis of the previous work on short-range correlation effects in electronic system, long-range and short-range correlation effects are considered simultaneously in this study. The results give not only relative roles of the two correlations at a certain momentum transfer, but also their combined effects on the dynamic form factors and structure factors at an arbitrary momentum transfer region. Our results describe well the occurrence of double peaks in to dynamic form factors at an intermediate momentum transfer region. It is possible to provide with more correct ground state energies of several simple metals.

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설명 1-4.

Universality of k^{3^n} - and k^{4^n} -cascades for Area-Preserving Maps.

KOO-CHUL LEE and SANG-YOON KIM(S.N.U.) and DUK-IN CHOI(KAIST). We have studied numerically period-trebling and period-quadrupling cascades of periodic orbits of 2-dim. area-preserving maps. The period-trebling δ_n -sequence converges as $n \rightarrow \infty$, and the limit value is 20.2. Unlike the period-doubling cascades, each of period-trebling α_n - and β_n -sequences has two limit values. Two limit values of α_n -sequence are -17.9 and 2.45, and two limit values of β_n -sequences are -31.0 and 6.02. On the other hand the period-quadrupling δ_n -, α_n - and β_n -sequences converge as $n \rightarrow \infty$. The numerical study also shows that period quadrupling sequences confirm the universal scaling behavior irrespective of basic period k . The universal scaling constants δ , α and β are 24.5, -5.61 and 14.3 for the period quadrupling sequence.

설명 1-5.

Phase Transition of the F.C.C. Ising Ferromagnet with Competing

Interactions. JOO YOUNG LEE, DOOCHUL KIM(S.N.U.) and JONG HOON OH(KAIST). The correlated mean field theory and the Monte Carlo simulation are utilized to determine the