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1. The orbital angular momentum of the Co atom in Co_2MnSn

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The electronic structures of Co_2MnSn are calculated by the interpolation scheme which is applicable to the Heusler alloys as an extension of the method used by Mueller (1966). The parameters in the interpolation scheme are determined so as to reproduce the energy values caluculated by SAPW method. It has been expected that for the Co atom in the alloys Co_2MnSn, Co_2TiSn and Co_2TiAl, the orbital angular mementum contributes to the magnetic moment and the internal magnetic field. Therefore, the orbital angular momentum of the Co atom in Co_2MnSn has been calculated by the perturbation theory in terms of the spin–orbit interaction.

It will be discussed whether the orbital angular momentum is quenched or not.

2. Quantum Molecular Dynamics Study of a Two-level Model with an Alternative External Field

白石貞純

Periodic and quasi-periodic response of a two-level model, whose Hamiltonian is expressed by a pseudo-spin operator, is studied numerically and analytically, where the methods (1) Fourier analysis (2) stroboscopic representation and (3) projection of an orbit are used. In generally, the model shows a quasi-periodic motion. However, the intensity of the external

field E takes a specific value, the motion becomes a periodic motion of which periodicity is N times bigger than that of the external field. The structure of this synchronization phenomenon is expressed by $N[(\omega-\Omega)^2 + (\mu E/2)^2]^{1/2} = n\omega$; (n=1, 2, 3, . . .) where ω is the angular frequency of the external field, Ω is the tunneling frequency and μ is the electric moment.

We find that the motion is expressed approximately by three modes for a weak external field. The transition probability in a two-level laser is calculated using this approximate solution. This approximate solution is better than Rabi's solution which is widely used in the two-level laser theory.

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外磁場中の ^{3}He − ^{4}He 混合溶液における拡散現象の統計熱力学

上地　宏

平衡統計熱力学の基礎は J. W. Gibbs や他の人々によってその基礎が築かれ十分に発展した理論であるが，非平衡統計熱力学はその研究の方法においていくつかの方法が存在し，それらは独立に同様な結果を出すように思える。 Zwanzig は「非平衡統計熱力学を研究する方法においてどの方法を用いるかは研究者の好みによる」と述べている。

この論文では局所平衡分布を利用して議論する。しかし局所平衡分布設定の議論については Mc Lennan, Zubarev 等の論文にそって考察していく。

考察の対象とする系としては，一様な外磁場中の ^{3}He − ^{4}He の稀薄混合溶液に spin echo 法におけると同様にパルス（一般に θ degree-pulse ）をかけて非平衡状態をつくり，その時に局所平衡分布を想定し，非平衡状態のエントロピーについて考察する。