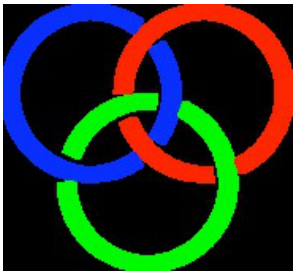

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Few-body structure of polar molecules in two dimensions.

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We investigate two, three and four polarized cold dipolar molecules in layered structures [1]. We first study the two-body problem with anisotropic potential. We found numerically that the two particles always form a bound state. We shall give analytical expressions for energies and wave functions in the weak coupling limit where universality or model independence are approached, and the binding energy is extremely small [2,3]. The universal limit is essentially reached for experimentally accessible strengths. We compare analytic and numerical results obtained by the stochastic variational method.

We then turn to three identical dipolar molecules occupying only two layers. We show that all these structures are unbound but a reduction of the in-layer repulsion to about one third of the natural value would lead to binding. Extension to four dipolar molecules in two planes are always unbound. Two molecules in a central layer with one molecule in each of the neighboring layers is the structure closest to forming a stable four-body configuration with energy below the threshold energies. We calculate numerically the repulsion reduction in the central layer necessary to provide stability for both bosons and fermionic systems. We shall discuss the different two-dimensional few-body configurations, their structures and energies.

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