

Complex reflection groups, logarithmic connections and bi-flat F-manifolds

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We show that bi-flat F-manifolds can be interpreted as natural geometrical structures encoding the almost duality for Frobenius manifolds without metric. Using this framework, we extend Dubrovin's duality between orbit spaces of Coxeter groups and Veselov's v -systems, to the orbit spaces of exceptional well-generated complex reflection groups of rank 2 and 3. On the Veselov's v -systems side, we provide a generalization of the notion of v -systems that gives rise to a dual connection which coincides with a Dunkl-Kohno-type connection associated with such groups. In particular, this allows us to treat on the same ground several different examples including Coxeter and Shephard groups. Remarkably, as a byproduct of our results, we prove that in some examples basic flat invariants are not uniquely defined. As far as we know, such a phenomenon has never been pointed out before.

Based on joint works with Alessandro Arsie.

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