## On dispersion relations of integrable systems

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We study systems evolutionary odd order equations

$$u_t = \lambda_1 u_n + F_1(u_{n-1}, v_{n-1}, \dots, u, v) v_t = \lambda_2 v_n + F_2(u_{n-1}, v_{n-1}, \dots, u, v) \qquad n = 2s + 1, s \in \mathbb{N}$$
(1)

which possess infinite hierarchies of local symmetries. We formulate a number of conditions on the right hand side of the system which are necessary for the existence of an infinite sequence of local symmetries.

We show that the requirement of existence of an infinite hierarchy of commuting flows imposes tight constraints on possible dispersion laws of the system. The dispersion law of an integrable system carries important information on the structure of hidden symmetries and conservation laws. To determine possible dispersion laws for integrable systems is an important and far non-trivial problem.