Singular symplectic forms and Poisson-Lie algebras

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A constraint submanifold in a symplectic space after P.A.M. Dirac is determined locally by geometric restriction of the symplectic form to the constraint. The natural symplectic invariant associated to this restriction is the space of Hamiltonian vector fields which uniquely restrict to the solvable Hamiltonian ones on a constraint. By investigation of solvability of generalized Hamiltonian systems we characterize the constraint invariants and find them explicitly in the generic cases. Moreover the Poisson-Lie algebra on submanifold is constructed and an example of the Hamiltonian vector fields on the 2-sphere in symplectic space is considered. This is a joint research work with Takuo Fukuda.