PARTIAL POISSON CONVENIENT MANIFOLD

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ABSTRACT. We introduce a notion of weak Poisson structure on a manifold M modeled on a convenient space. This is done by specifying a weak subbundle $T'M$ of T^*M and an antisymmetric morphism $P : T'M \to TM$ such that the bracket $\{f, g\}_P = -< df, P(dg) >$ defines a Poisson bracket on the algebra $\mathcal{A}$ of smooth functions f on M whose differential df are sections of $T'M$. In particular, to each such function $f \in \mathcal{A}$ is associated a Hamiltonian vector field $P(df)$. This concept takes naturally place in the framework of weak symplectic infinite dimensional manifolds and also in infinite dimensional Lie algebroid. We will define this concept and will illustrate it by many natural examples. We will also give some results on the existence of (weak) symplectic foliation for special partial Poisson structures.