1019-57-13 **Vladimir V. Chernov*** (`Vladimir.Chernov@dartmouth.edu`), Mathematics Department, 6188 Bradley Hall, Dartmouth College, Hanover, NH. *Graded Poisson algebras on bordism groups of odd-dimensional garlands and minimizing the intersection of loops on a surface.* Preliminary report.

Fix a manifold M and a set $\mathfrak{N}$ consisting of closed manifolds. Roughly speaking, the space $G_{\mathfrak{N},M}$ of $\mathfrak{N}$-garlands in M is the space of mappings into M of singular manifolds obtained by gluing manifolds from $\mathfrak{N}$ at some marked points.

We define a bordism group $\hat{\Omega}_*(G_{\mathfrak{N},M})$ and operations $\star$ and $[\cdot,\cdot]$ on $\hat{\Omega}_*(G_{\mathfrak{N},M})\otimes\mathbb{Q}$. For $\mathfrak{N}$ consisting of odd-dimensional manifolds, $\hat{\Omega}_*(G_{\mathfrak{N},M})\otimes\mathbb{Q}$ is a graded Poisson algebra. The *mod* 2 analogue of $[\cdot,\cdot]$ for one element sets $\mathfrak{N}$ and some other operations were introduced in our previous work with Rudyak.

When $\mathfrak{N}=\{S^1\}$ and M is a surface, our algebra is related to Goldman-Turaev and to Andersen-Mattes- Reshetikhin algebras. Our Lie bracket gives the minimal number of intersection points of loops in homotopy classes $\hat{\delta}_1, \hat{\delta}_2$ of free loops on M^2, provided that there are no $\gamma\in\pi_1(M)$ and $i,j\in\mathbb{Z}$ such that γ^i realizes $\hat{\delta}_1$ and γ^j realizes $\hat{\delta}_2$. In particular, it gives the minimal number of intersection points in all the examples of loops with vanishing Goldman bracket constructed by Chas.

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