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**Multidimensional smooth loops with universal elasticity.** (English. Russian original)

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Let  $\tilde{E}$  be a universal (isotopically invariant) identity that is derived from the elasticity identity  $E : (xy)x = x(yx)$ . One of the authors has previously shown that a) each smooth local loop of dimension  $r$  with identity  $\tilde{E}$  (briefly, a loop  $\tilde{E}$ ) is a smooth middle Bol loop of dimension  $r$ ; b) smooth two-dimensional loops  $\tilde{E}$  are Lie groups; c) up to isotopy, there exist only two three-dimensional loops  $\tilde{E}$ : the loops  $E_1$  and  $E_2$ . In this paper, the loops  $E_1$  and  $E_2$  are extended to the multidimensional case. The fact that each smooth loop  $\tilde{E}$  of dimension  $r$  corresponds to a unique multidimensional three-web on a manifold of dimension  $2r$  is key to the work. The class of loops under investigation is characterized by the fact that the torsion tensor of the corresponding web has rank 1 (that is, the algebra generated by this tensor has a one-dimensional derived algebra). It gives the possibility to express the differential equations of the problem in an invariant form. The system of equations thus obtained was found to be amenable to integration in the most general case, and the equations of the required loops have been obtained in local coordinates.

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**MSC:**

[53A60](#) Differential geometry of webs

Cited in **1** Document

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