

Djondjorov, Peter A.; Hadzhilazova, Mariana Ts.; Mladenov, Ivaïlo M.; Vassilev, Vassil M. Explicit parameterization of Euler's elastica. (English) [Zbl 1196.53004](#)

Mladenov, Ivaïlo M. (ed.), Proceedings of the 9th international conference on geometry, integrability and quantization, Sts. Constantine and Elena, Bulgaria, June 8–13, 2007. Sofia: Bulgarian Academy of Sciences (ISBN 978-954-8495-42-4/pbk). 175-186 (2008).

The authors deal with the dynamic system modeling of a novel explicit parametrization of Euler's elastica. It has the form of a system of nonlinear coupled ordinary differential equations

$$\ddot{x} - \lambda z \dot{z} = 0, \quad \ddot{z} + \lambda z \dot{x} = 0, \quad \lambda > 0.$$

The solution (x, z) is expressed using the complete elliptic integral of the first kind. A geometrical and mechanical analysis of the solution is performed.

For the entire collection see [\[Zbl 1154.17001\]](#).

Reviewer: Igor Bock (Bratislava)

MSC:

[53A04](#) Curves in Euclidean and related spaces

[74B20](#) Nonlinear elasticity

Cited in **5** Documents

Keywords:

[Euler's elastic curves](#); [fictitious dynamic system](#); [elliptic integral](#)