USING THE *AUSDEHNUNGSLEHRE* AND *MATHEMATICA* TO DETERMINE THE UNKNOWN PARAMETERS OF GRASSMANN CHAIN MECHANISMS WITH TWO AND THREE INPUT SOURCES

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ABSTRACT: The Grassmannian mathematical system, well known as the *Ausdehnungslehre* together with the symbolic computational program *Mathematica* is used to synthesise a class of planar mechanisms, named Grassmann Mechanisms. The objective of investigating Grassmann Mechanisms is to be able to compute easily the design parameters of the mechanism from their precision points.

Mechanisms in this class have only moving links rotating on pivots. The paper reports on a type of synthesis result of Grassmann Mechanism with two input sources using four precision points. Extending this type of Grassmann Mechanism the paper implements a new type of mechanism named Grassmann Chain Mechanism which has three input sources. A synthesis result of this type of mechanism is also presented using two precision points and two precision lines for the last mechanism of the chain and four precision points for the join mechanism. Numerical examples are presented to justify the simplicity of the Grassmannian method to mechanism design.