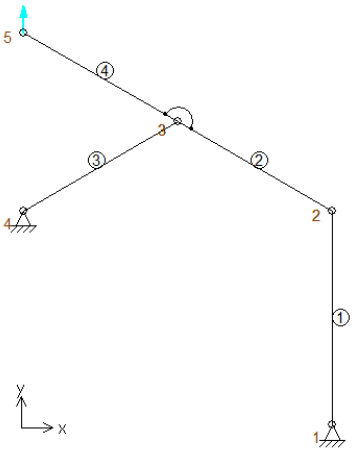
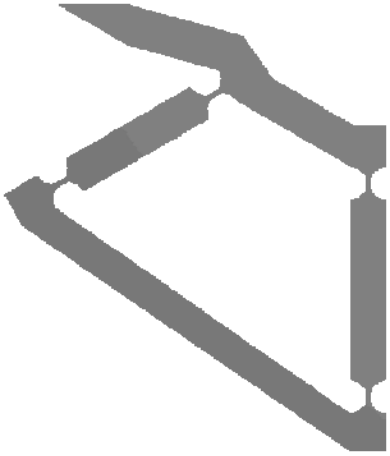
Compliant linkage mechanism for rectilinear guiding

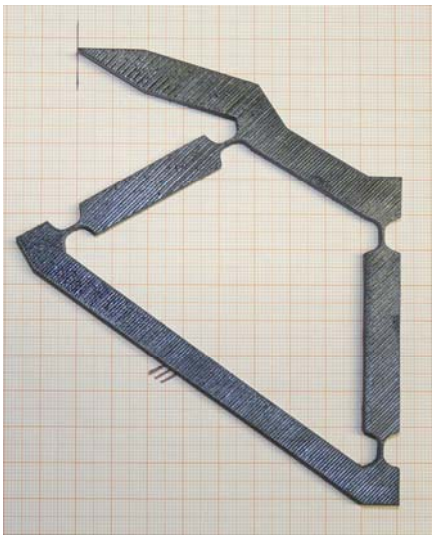
System: Compliant mechanism with four prismatic flexure hinges



Rigid-body mechanism



Compliant mechanism



Functional model (rapid prototyping)

Functional principle:

- four-bar linkage for the realization of an approximated rectilinear path of an coupler point (Evans mechanism)
- design as compliant mechanism with prismatic flexure hinges
- mobility due to elastic deformation within the flexures
- special deformation and motion behavior possible by geometrical design and optimization of the flexure hinge contour

Characteristics and advantages:

- fully compliant mechanism with concentrated distribution of compliance
- four prismatic flexure hinges with stress und pivot optimized polynomial contour of 4^{th}-order
- monolithic design and thus no clearance, friction, wear and maintenance
- realization of a path deviation in the micrometer range
- high reproducibility of the motion path

Application:

- precision applications in Micromechanical Systems Technology, Precision Engineering and Measurement Technology
- increasingly high-precision motion systems in medical engineering and robotics

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