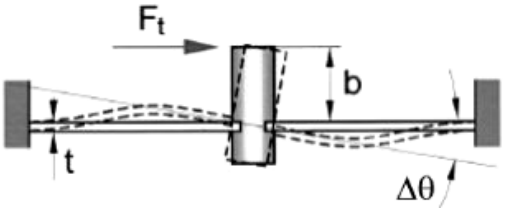


The program allows to define moving of the lever attached on the centre of a round membrane, fixed on a contour.

The design is described in the article: **M. Cannella, F. Marinozzi**, *Design of a three-component capacitive force transducer*, Review of Scientific Instruments**,** vol. 72, n. 8, pp. 3411-3417, August 2001. In this work the membrane was used for measurement of the forces acting on three directions. The similar decision is described in the US patents 5.492.020 (1996),.

The membrane bended under the influence of the moment of measured force is a springing element. With its help the force will be transformed to displacement which can be easily measured. At small displacements the membrane material has elastic deformations. In this case there is no hysteresis and nonlinearity during force – to – displacement conversion.

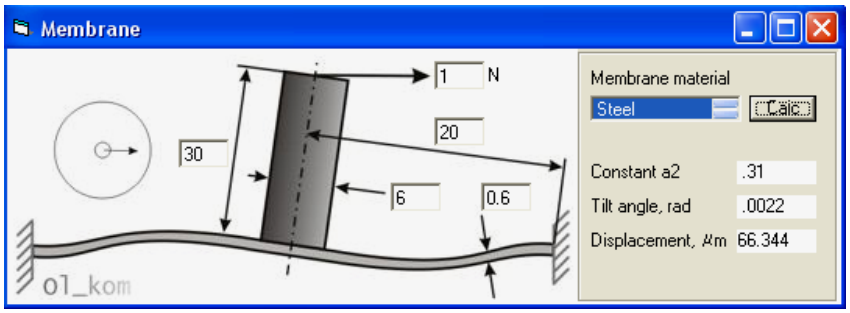
The formulas used for engineering calculations of a bend of a membrane, are resulted by authors of article under the book Roark's Formulas for Stress and Strain. Расчет мембран, изгибаемых при различных способах закрепления, также содержится в книге Calculation of the membranes bent at various ways of fastening, also contains in the book of **Timoshenko S. P., Woinowsky-Krieger S.**, *Theory of Plates and Shells*.

The angle of membrane bend and, accordingly, tilt of the lever, is defined under the formula

$$\Delta\theta = \frac{F_t b}{\alpha_2 E t^3}$$

r/R	a_2
0.5	12.40
0.6	28.48
0.7	77.90
0.8	314.00

Constant a_2 has obtained empirically and depends on relation ***r/R***, where ***r*** – radius of the core (lever) which is passing through the centre of a membrane; ***R*** – membrane radius. ***E*** – The Young modulus of a material of a membrane.



Approximation of tabular data of dependence of a constant a_2 from a parity ***r/R*** has been made for convenience of calculations. The user has possibility to define geometry of a unit and to choose a membrane material. Results of calculations are value of a constant a_2, an angle of turn of the lever (radian) and displacement of the free end of the lever under the influence of the applied force.