A new approach to Newton Aerodynamic Problem

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Isaac Newton studied the following problem in his book "Philosophiae Naturalis Principia Mathematica", in 1687:

Find a rotating body of given length and width which has the minimal resistance when moving in the rarefied media.

Some mathematicians tried to solve this problem using methods of Calculus of Variations, but they obtained absurd solution. Much later it was discovered that Newton Aerodynamic Problem belongs to a class of Optimal Control problems and that it should be solved using Pontryagin's Maximum Principle.

Here we consider a more general problem:

Find a convex body of given length and given maximal section, which has the minimal resistance when moving in the rarefied media.

We prove the existence of a solution of this problem.