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The great engineering achievement required to overcome most of the challenges and obstacles that prevented turning rocket design from art into science took place in Europe and the United States during the first half of the 20th Century.

With the vast majority of the engines currently in operation developed in the “pre-computer” age, there are new opportunities to update the design methodologies using technology that can now handle highly complex calculations fast.

The space sector with an intense focus on efficiency is driving the need for updating, adapting or replacing the old modeling practices with new tools capable of reducing the volume of resources and the time required to complete simulations and analysis. This book presents an innovative parametric model applicable to the project of some elements of the liquid rocket thrust chamber with the level of detail and accuracy appropriate to the preliminary design phase.

What will be addressed in this work is the definition of the operating characteristics and dimensioning of some thrust chamber elements through a set of equations and parameters, which include the engine thrust, the combustion chamber pressure, and the propellant characteristics. The model degree of sophistication was adjusted to the requirements of the preliminary design phase, while also enabling quick analysis of new configurations resulting from changes in initial project parameters.