WHAT IS CLAIMED IS:

1. A rocket engine comprising a casing circumferentially extending around a longitudinal axis to circumscribe a combustion chamber, the combustion chamber extending along the longitudinal axis and having an inlet and an outlet, the combustion chamber defining a fuel-receiving volume, the inlet fluidly connectable to a source of oxidizer, the outlet in fluid communication with an environment outside the combustion chamber for expelling combustion gases, a solid fuel located within the fuel-receiving volume, the solid fuel including a first solid fuel and a second solid fuel configured to be exposed to the oxidizer injected in the combustion chamber via the inlet, the inlet including at least one aperture defined through the casing and located axially between the fuel-receiving volume of the combustion chamber and the outlet of the combustion chamber relative to the longitudinal axis, the first solid fuel having a regression rate less than that of the second solid fuel when exposed to a same oxidizer flux such that a variation of an oxidizer flux is at least partially compensated by a variation of the regression rates of the first solid fuel and the second solid fuel, the first solid fuel and the second solid fuel are axially offset from one another relative to the longitudinal axis, the solid fuel burning along a regression direction parallel to the longitudinal axis, the first solid fuel located in front of the second solid fuel, and closer to the outlet of the combustion chamber than the second solid fuel, such that the first solid fuel is burned before the second solid fuel.

2. The rocket engine of claim 1, wherein the solid fuel includes a third solid fuel, the first solid fuel, the second solid fuel, and the third solid fuel being disks disposed in series along a longitudinal axis of the rocket engine.

3. The rocket engine of claim 2, wherein the first solid fuel has a first viscosity, the second solid fuel has a second viscosity less than the first viscosity, and the third solid fuel has a third viscosity less than the second viscosity, the second solid fuel disposed between the first solid fuel and the third solid fuel.

4. The rocket engine of claim 3, wherein the rocket engine has a convergent-divergent nozzle in fluid communication with the outlet of the combustion chamber, the first solid fuel being closer to the nozzle than the third solid fuel and the second solid fuel.

5. The rocket engine of claim 4, comprising an injector plate (1322) located at a converging section (1306a) of the convergent-divergent nozzle.

6. The rocket engine of claim 1, wherein the first solid fuel and the second solid fuel are cylinders.

7. The rocket engine of claim 6, wherein the first solid fuel and the second solid fuel have a face exposed to the oxidizer.

8. The rocket engine of claim 7, wherein the face is circular.

9. A rocket engine comprising a casing circumferentially extending around a longitudinal axis to circumscribe a combustion chamber, the combustion chamber extending along the longitudinal axis and having an inlet and an outlet, the combustion chamber defining a fuel-receiving volume, the inlet fluidly connectable to a source of oxidizer, the outlet in fluid communication with an environment outside the combustion chamber for expelling combustion gases, a solid fuel located within the fuel-receiving volume, the inlet including at least one aperture defined through the casing and located axially between the fuel-receiving volume of the combustion chamber and the outlet of the combustion chamber relative to the longitudinal axis, the solid fuel configured to be exposed to the oxidizer injected in the combustion chamber via the inlet and having a rheological property varying therethrough along a regression direction being parallel to the longitudinal axis, the first portion of the solid fuel located in front of the second portion of the solid fuel, and closer to the outlet of the combustion chamber than the second portion of the solid fuel, such that the first portion of the solid fuel is burned before the second portion of the solid fuel.

10. The rocket engine of claim 9, wherein the rheological property is a viscosity of the solid fuel, the viscosity decreasing in the regression direction.

11. The rocket engine of claim 9 or 10, wherein the rocket engine has a convergent-divergent nozzle in fluid communication with the outlet of the combustion chamber.

12. The rocket engine of claim 11, comprising an injector plate (1322) located at a converging section (1306a) of the convergent-divergent nozzle.

13. The rocket engine of any one of claims 9 to 12, wherein the solid fuel is a cylinder.

14. The rocket engine of claim 13, wherein the solid fuel has a face exposed to the oxidizer.

15. The rocket engine of claim 14, wherein the face is circular.