

Liquid Fueled Thorium Reactors *without equations*

$$\sum \otimes x < \sqrt{+ -} = \prod \Phi - \otimes^* \pm$$

An overview of liquid-fueled liquid-cooled thermal spectrum Thorium breeder reactors and why they matter.

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Science Engineer- Nuclear Option

19 October 2009

Power makes a difference.



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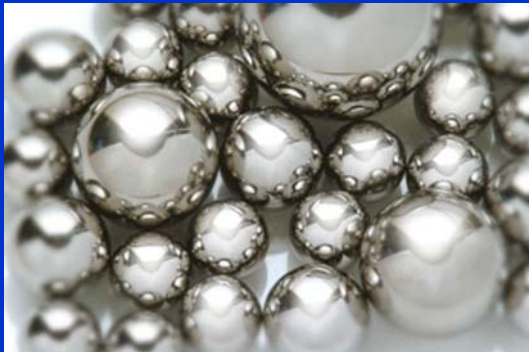
The Necessities

- Self regulating when it is ON
- Passively safe when it is OFF
- Inherently safe in case of an ACCIDENT

Fuel for a lifetime?

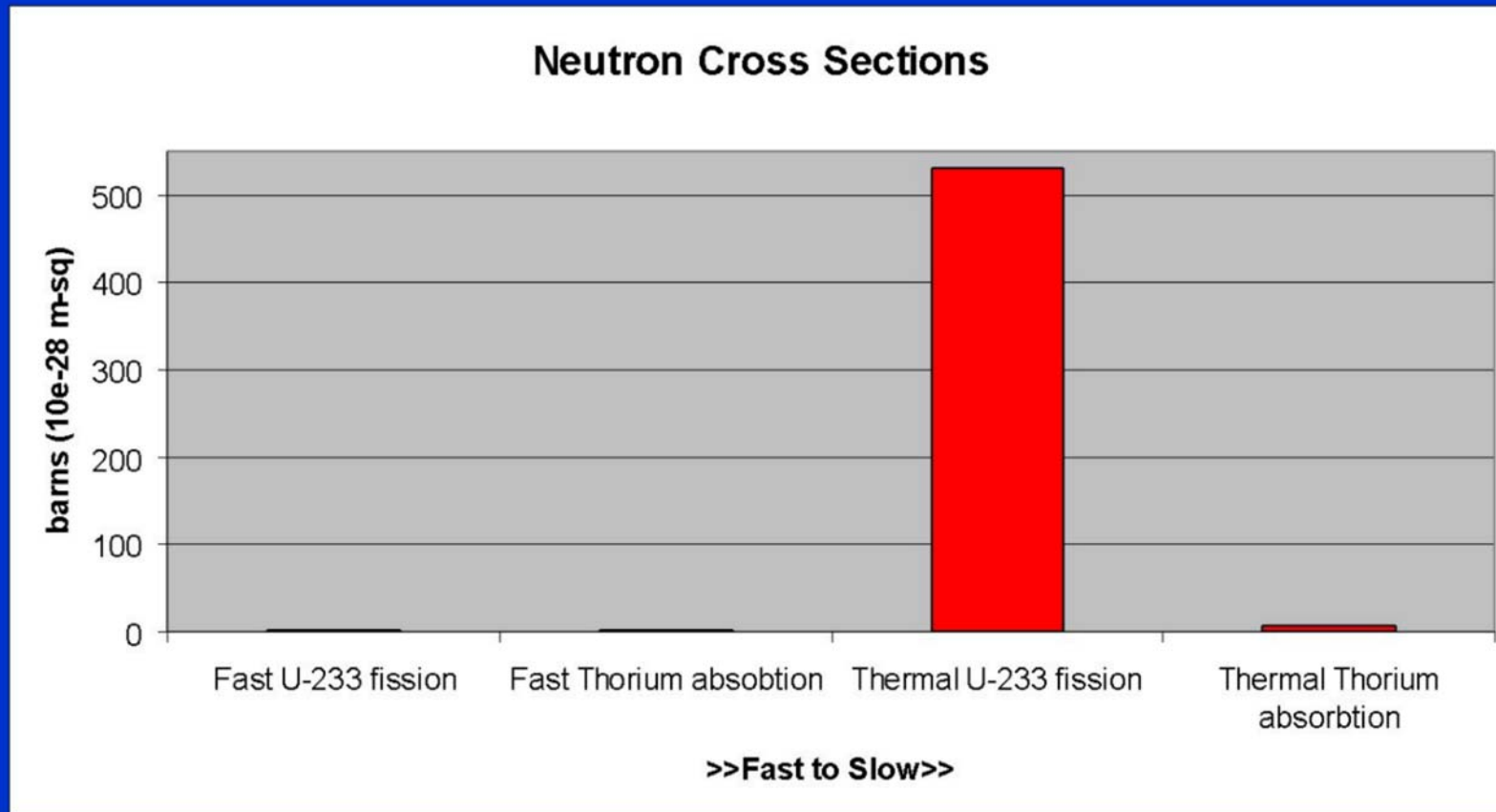
You consume a ball of coal
10 meters in diameter...

...or a ball of thorium 37mm in diameter.



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Moderation and nuclear probabilities



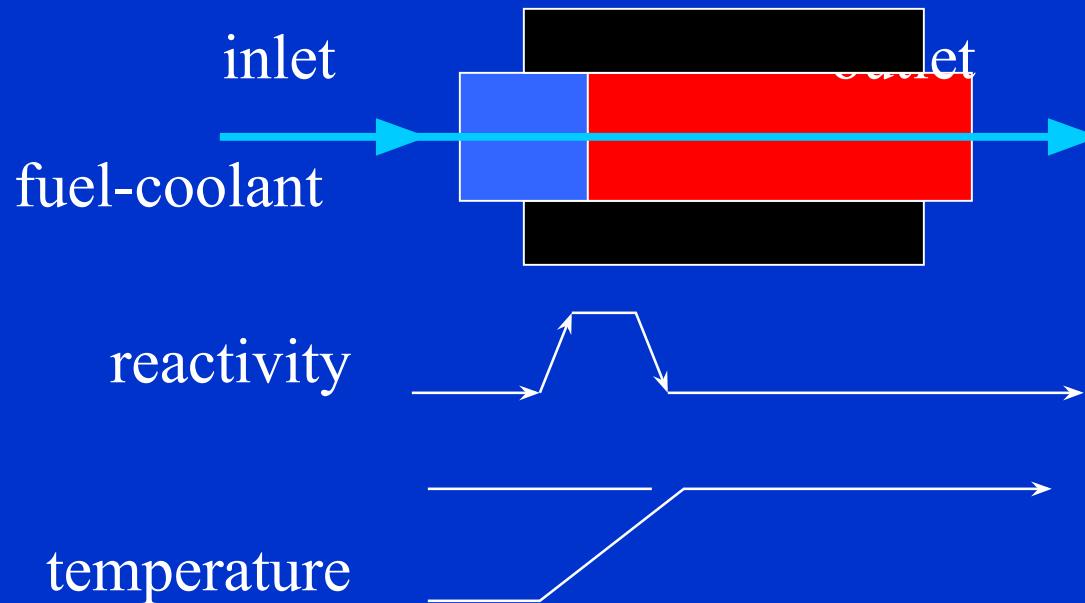
Speed?



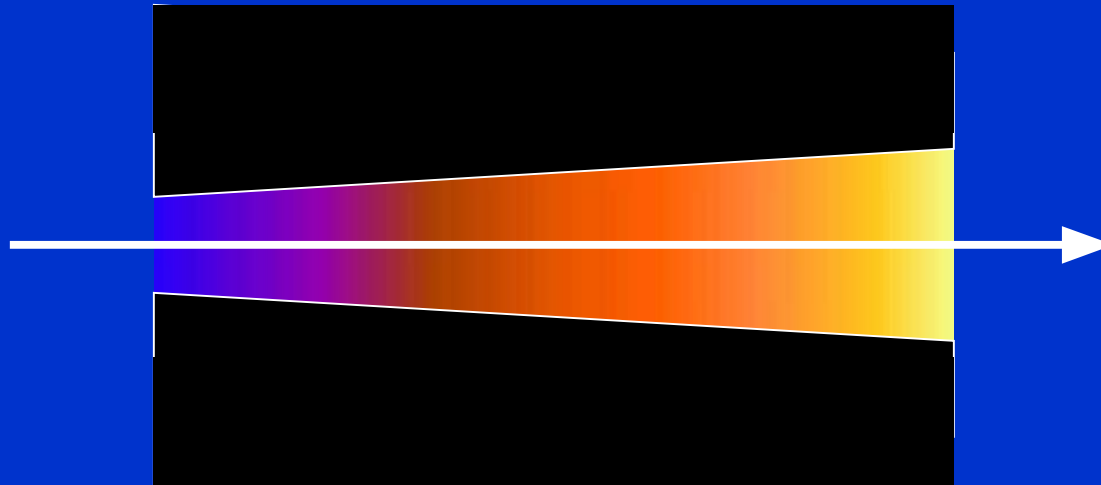
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What does it mean if a reactor is extremely temperature stable?

A power plant with a built in thermostat!



Improved reactor design



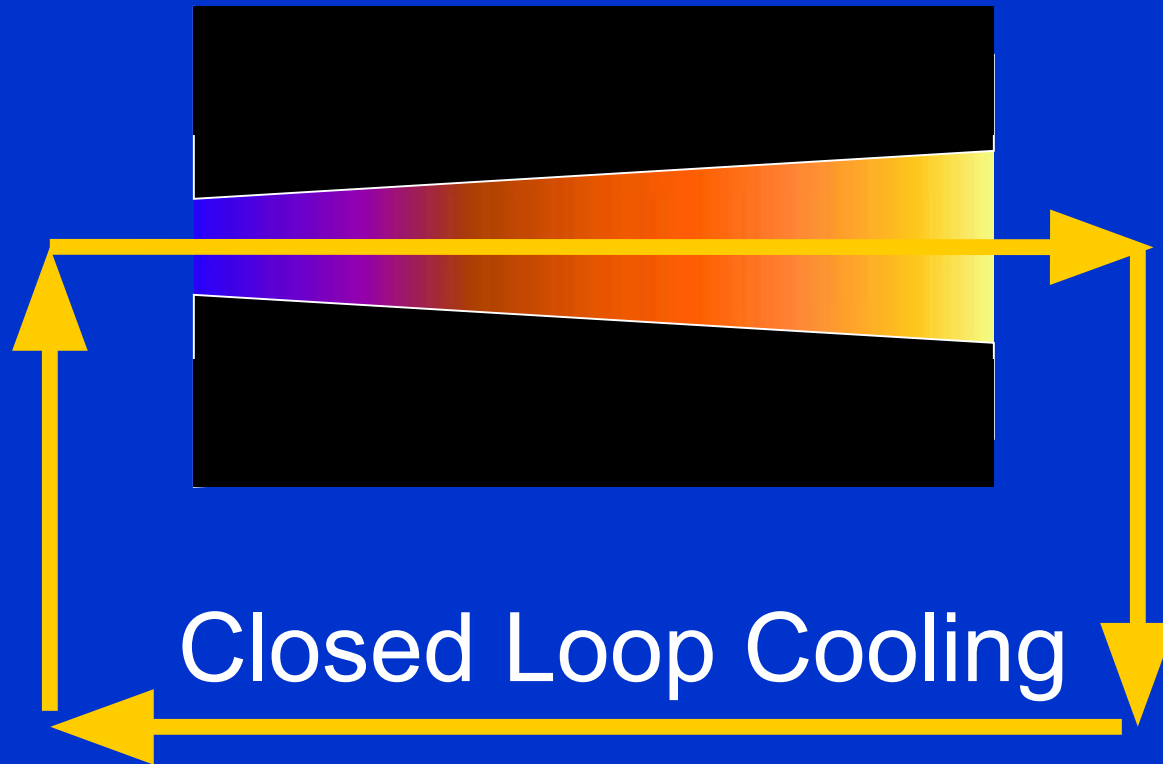
reactivity



temperature



The Reactor at “idle”



An Efficient Design

- Little or no radioactive waste
- No bomb materials
- Low cost per power delivered
- A small physical size
- A wide choice of building sites.

Size matters!



Your nuclear waste is the size of a few grains of rice!

Lets Make Power



- The heat transfer fluid (molten salt) is at low pressure.
- We can use a gas cycle, like a jet engine, at high temperature.
 - This means they can have high efficiency, a 50% reduction in power rejected to the environment per power delivered to the electric grid.
- These plants can run at partial load.

THE WORLD IS FLAWED



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