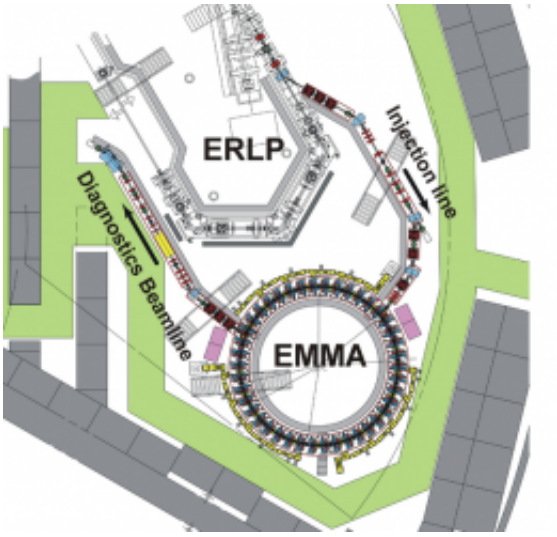
# New pint sized particle accelerator leads the way to clean nuclear energy

June 20 2011, by Bob Yirka




The EMMA ring in relation to the main ERLP (ALICE) accelerator.

(PhysOrg.com) -- Researchers at Daresbury science park in Britain have offered a glimpse into what might be the future of nuclear energy production by showcasing a scaled down particle accelerator; one, that when combined with others just like it, could produce nuclear energy based on thorium, rather than uranium. Dubbed the Electron Machine with Many Applications (EMMA), the accelerator, a much smaller version of the kind used in physics research, such as the Large Hadron Collider, could be used to provide an accelerated beam necessary for the type of nuclear reaction used in a theoretical thorium plant.

Thorium, named for the Norse god of thunder, is a silver-white metal found in abundance all over the planet, and is only very slightly radioactive and as such is a member of the elements known as actinides which, like uranium, occasionally spin off particles which make it useful for energy production. But unlike uranium, thorium is relatively clean because it decays much faster leaving far less reactive byproducts behind; and because it requires a constant bombardment of particles to keep it reacting, is incapable of producing a meltdown; something on the minds of people in the aftermath the Fukushima disaster.

That's where EMMA enters the picture. To produce the constant stream of particles needed to keep a thorium reaction going, an accelerator is needed, but it wouldn't have to be the huge billion dollar kind, more like the kind you could fit in your garage, or in this case in a lab on the boggy Cheshire flatland, just east of Liverpool, where reporters from the U.K. newspaper *Mail*, were recently given a tour. They report that EMMA is "an object of scientific beauty..."

Scientists have known since the 1950's that thorium could be used to produce electricity, just as uranium is today; what kept them from doing so was the desire to use technology that could be used in conjunction with atomic weapons, which pushed thorium research aside due to its impracticality for such applications. Today however, things have obviously changed, several countries besides Britain are taking a very hard look at thorium and the ways it could be put to good use and at small particle accelerators too; the team in Britain is also currently at work designing the Particle Accelerator for Medical Applications (Pamela) to be used to help treat hard to reach cancer in patients.

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