Re: Radiation shielding for unmanned lander on Io

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On 22 Mar, 23:04, "Harvey" <harveypoll...@xxxxxxxxxxxx> wrote:

> Hi
>
> I am studying for an Astrophysics degree. I am carrying out a short
> theoretical study considering the problems associated with placing an
> " unmanned lander" on the surface (from the point of view of radiation
> shielding) on the surface of the Jovian moon Io. I know that
> environment on Io contains extremely strong electromagnetic and
> magnetic fields
>
> Can you someone advise me:−
>
> a) where I could find a relevant tutorial on the subject of radiation
> shielding.

Google? But try looking for RXF1, or here for starters:
http://science.nasa.gov/headlines/y2005/25aug_plasticspaceships.htm

> b) Suiggest links regarding the sort of the radiation protection
> techniques required to avoid disruption the the on−bord electronic
> intrumentation

I've heard that old fashioned electronics works better. I imagine you could develop a self correcting triple system. Something like take three SD cards, which are mirrored. A program constantly goes through and finds bit level errors and corrects them.

I think the whole architecture would need to be redesigned to cater for a much higher level of data corruption. Not sure where you find out about that.

> c) Can I use the same type of shielding for both magnatic field and
> elctromagnetic field
> d) The strength of the fields to be expected on Io

According to Zubrin in Entering Space, at Io orbit, radiation is 3,600 REM per day, which would probably kill a human in an hour. As for the strengths of the fields, it should be possible to compute this given Io's orbit and Jupiter's magnetic field strength.

Any advice on the topic would extremely appreciated

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