Re: Quiet Sun

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- *From*: "Home Despot" <Despot@ynjhg ybj.com>
- *Date*: Wed, 22 Feb 2006 23:58:16 GMT

"Brian Tung" <brian@xxxxxxx> wrote in message
news:dtiqttek1@xxxxxxxxxxxxxxxxxxx

> Chu Mai Wang wrote:
>
> > I have wondered if the technology for sunspot detection just wasn't good
> > enough during that period. What were the best telescopes of the time?
> > Did they just project the suns image onto paper to see sunspots or did
> > they have sun filters then?
>
> They didn't have solar filters. They either used solar projection or,
> in a few cases, they may even have looked directly at the Sun near
> sunrise or sunset. Not a good tactic. (This means you!)
>
> It is true that sunspot records were considerably more sporadic than
> they are today, so that if they were all we had to go on, we would
> indeed consider the evidence suggestive but inconclusive. As it
> happens, however, there is some independent evidence for the Maunder
> Minimum and other extended solar minima. If I recall correctly, solar
> minima and maxima are correlated, even when the cycle is active, with an
> increased solar magnetic field, which acts to partly shield the Earth
> from cosmic rays.
>
> The most numerous of these cosmic rays are protons. Now, when protons
> make it into the atmosphere, they occasionally start a burst of
> secondary radiation, of which some are speeding neutrons (which would
> not be deflected by the solar magnetic field, incidentally). Some of
> those neutrons encounter a nucleus of nitrogen−14, the most common atom
> in the atmosphere. When they do, they typically dislodge and replace a
> proton, converting the nitrogen−14 into carbon−14.
>
> Carbon−14, as you probably know, is not stable. It is radioactive, with
> a half−life of about 5,700 years. (For those more used to exponential
> formulations, that means it has a mean life of about 8,200 years.) As
> a result, even as cosmic rays are converting N−14 into C−14, beta decay
> is converting the C−14 back into N−14, and in this way, an equilibrium
> is maintained. At any time, there are about a trillion C−12−−the most

> common isotope−−atoms for every C−14 atom. Sounds tiny, but it still means that a typical air balloon (not helium) containing, oh, let's say 22.4 liters of air, has about a quarter of a billion C−14 atoms.
>
> As long as an organism is living, it exchanges carbon atoms with the surrounding environment, and so its C−14 to C−12 ratio remains at about one in a trillion. As soon as it dies, however, it ceases to take in carbon, and C−14 begins a long slide toward zero. This is the basis for radiocarbon dating.
>
> The significance of this for the Maunder Minimum is that we can look at tree rings and determine which rings fall in the Maunder Minimum, and figure out what the C−14 levels were at that time. They appear to be consistently high during that time (as David mentioned, around 1645 to 1715, roughly coincident with the reign of the Sun King, ironically enough [1]), which is consistent with elevated levels of cosmic rays, and therefore with reduced solar activity.
>
> In this way, other minima have been tentatively identified, some of which predate any possible sunspot record, and which range in duration from decades to centuries. They seem to come at random intervals with no obvious pattern. If these minima are real, what causes them? Nobody knows for sure.

And that just about winds up todays archeology 321 lecture. Here..comes, the Sun King...everybodies laughing, everybodies happy....

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