

Re: Lightning without thunder?

Source: <http://sci.tech-archive.net/Archive/sci.geo.meteorology/2006-08/msg00000.html>

- *From:* "Yokel" <yokel@xxxxxxxxxxxxxxxx>
 - *Date:* Fri, 28 Jul 2006 23:35:54 +0100
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<footejf@xxxxxxx> wrote in message
news:0icdc2hv91nb63gvj5sk1s5ne9pnnnot3gj@xxxxxxxxxx
| On Tue, 25 Jul 2006 22:48:34 GMT, Ron Hardin <rhardin@xxxxxxxxxxxxxxxx>
| wrote:
|
| >Al Deveron wrote:
| >>
| >> Is there any known kind of lightning flash that doesn't have
| >> accompanying thunder?
| >>
| >> I was camping out a few nights ago, and for about 45 minutes, during
| >> the night, I saw intermittent lightning flashes, but saw no lightning
| >> bolt and heard no thunder. The location was in the South West of
| >> England in a rural area on the coast. The lightning flashes were
| >> bright, white, and powerful and seemed in close proximity. It was the
| >> sort of lightning flash that would normally be quickly followed by a
| >> loud crack of thunder.
| >>
| >> TIA
| >>
| >> Al Deveron
| >
| >Sound is refracted by for example temperature changes, and there
| >may be no path for it from the lightning to you.
| >
| >You get a mathematical surface with sound on one side and no sound
| >on the other, the sound side hearing two different paths at once.
| >Called a caustic surface. What happens in its vicinity requires
| >a wave solution of the acoustic equations (rather than ray tracing).
| >
| >The refraction is why a jet plane sounds intermittently loud and soft,
| >as rays of sound are focussed on you and then defocussed as the ray
| >passes various thermals refracting it.
|
| And then there's what locals here in the Upper Great Lakes of the U.S.
| call "heat lightning", where you see the flashes but don't hear the
| thunder. "Heat lightning" is really just someone else's thunderstorm,
| but you get to see the display and can't hear the cheer. Thunderheads
| can be seen, at various latitudes, from in excess of 150km away, and

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| all of the lightning may be caught up in that after sunset. Pretty
| obvious, as brilliant as these displays can be, that sound does not
| travel with the same efficiency or distance as light.
|
| Not disagreeing with the above poster, just offering a simpler
| explanation.

Many of the recent storms we have had in the UK have been due to mid-level instability release (hot, humid air from the Mediterranean area running under cooler westerlies aloft) with little or no convection from the surface layers. These have been producing storms 2 to 3 miles up in altocumulus castellanus and floccus – no low level Cb as you know them. The more newsworthy storms have been formed when excessive heat has "broken the cap" or convection from low levels has been triggered by convergence on outflow winds from the high-level storms.

Such a storm can pass overhead and produce no more than muffled thunder if all the strikes are intercloud. We have recently had such storms where I live, which is probably about 150 miles from where the OP was on holiday. You get the big flashes but a 10–15 second delay before the long, faint rolls of thunder because the lightning is 2–3 miles away – straight up.

These storms can also produce quite bright reflections in other, inactive, clouds. We also had a demonstration of that here a night or two back when some very active storms passed over with the normal thunder and lightning. An hour or so later the storms had moved away so the thunder was barely audible but reflections from layer cloud to the SW gave the false impression that more storms were coming.

Because of the shock wave caused by sudden heating in the lightning channel, I do not think there is any kind of "normal" lightning (I am discounting phenomena such as "ball" lightning and also the high-level "sprites" which pass through a very rarefied atmosphere) which does not produce thunder, even if refraction effects such as mentioned by another poster greatly attenuate the sound.

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– Yokel –
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Yokel @ Ashurst New Forest
SU 336 107 17m a.s.l.

"Yokel" now posts via a spam-trap account.
Replace my alias with stevejudd to reply.

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