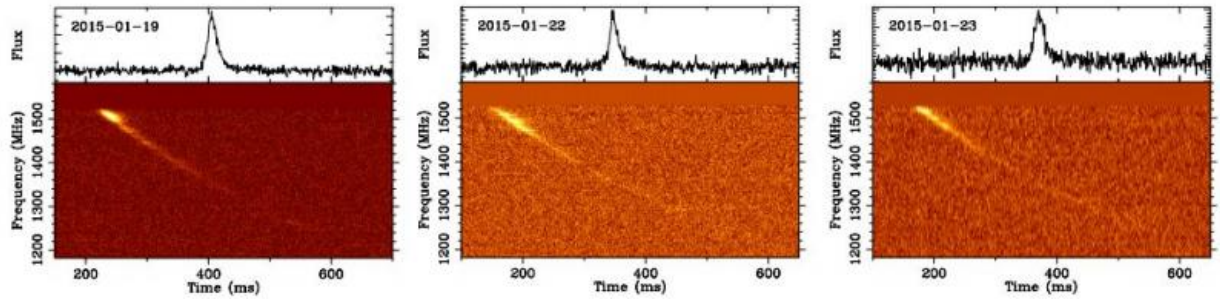
Mystery of peryton reception at Australian observatory solved: It's from microwave ovens

April 13 2015, by Bob Yirka



The time-frequency structure of the three January perytons. In the case of events on 2015-01-19 and 2015-01-23 the summed 13-beam data is shown. For 2015-01-22 only beam 01 is plotted as the outer beam data was not recorded to disk. Credit: arXiv:1504.02165 [astro-ph.IM]

(Phys.org)—A team of researchers working at Australia's Parkes Observatory has found the source of at least one kind of peryton—a type of radio signal similar to Fast Radio Bursts (FRBs) which are known to come from somewhere else in the galaxy—microwave ovens in a kitchen nearby. The team has written about their investigation and findings in a paper they have uploaded to the *arXiv* preprint server.

For several years space scientists have been studying radio signals that emanate from unknown sources—some from somewhere nearby, others

from the distant galaxy. The ones that were found to come from close sources have been named perytons—theories about their origin have typically focused on meteorological and/or terrestrial phenomena. No one really knows the source of FRBs, but scientists have suspected it should be possible to track down the source of perytons, since they come from somewhere nearby. To learn more, the research team set up a real-time radio interference monitor at the Parkes site and then waited for the telescope to detect some perytons—they did not have to wait long, this past January, the telescope picked up three peryton signals, but so did the interference monitor. Analysis of data from the device suggested the source was similar to that emitted from microwave ovens.

Taking a closer look, the team found they could reproduce the peryton signals received by the telescope by simply opening the door to a microwave in the break room before its timer went off—that tiny moment of time when the magnetron was still pumping out microwaves when the door was open—that allowed for a very short burst of microwave activity that was of course picked up by the telescope.

It is still not clear if microwave ovens can be blamed for all instances of peryton reception, but it is a sure bet that any site that hears such signals in the future will first check to see if they are originating around lunch or dinner time. The finding does not suggest FRBs might be generated by a more earthly source, however, since their signals arrive from just one point in space and unlike perytons, they happen at random times.

More information: Identifying the source of perytons at the Parkes radio telescope, arXiv:1504.02165 [astro-ph.IM]
arxiv.org/abs/1504.02165

Abstract
"Perytons" are millisecond-duration transients of terrestrial origin, whose frequency-swept emission mimics the dispersion of an astrophysical

pulse that has propagated through tenuous cold plasma. In fact, their similarity to FRB 010724 had previously cast a shadow over the interpretation of "fast radio bursts," which otherwise appear to be of extragalactic origin. Until now, the physical origin of the dispersion-mimicking perytons had remained a mystery. We have identified strong out-of-band emission at 2.3—2.5 GHz associated with several peryton events. Subsequent tests revealed that a peryton can be generated at 1.4 GHz when a microwave oven door is opened prematurely and the telescope is at an appropriate relative angle. Radio emission escaping from microwave ovens during the magnetron shut-down phase neatly explain all of the observed properties of the peryton signals. Now that the peryton source has been identified, we furthermore demonstrate that the microwaves on site could not have caused FRB 010724. This and other distinct observational differences show that FRBs are excellent candidates for genuine extragalactic transients.