

Engineering students use sound waves to put out fires

March 26 2015, by Bob Yirka



Two engineering students at George Mason University have found a way to use sound waves to quash fires and have built a type of extinguisher using what they have learned that they hope will revolutionize fire fighting technology. Viet Tran a computer engineering major and Seth Robertson, an electrical engineering major, chose to investigate the possibility of using sound to put out fires as a senior research project and now believe they have found something that might really work.

Prior research has shown that [sound waves](#) can impact fires, and other researchers, such as those working for DARPA a couple of years ago, even investigated the possibility of using sound to put out fires, but thus

far, no sound based extinguishers have been built and sold as a means to stop fires. The research by the duo at GMU might change that.

As the two students told members of the press, they started with the simple idea that sound waves are also mechanical or pressure waves (due to the back and forth motion of the medium in which they pass through), which can cause an impact on objects. In this case, on the material that is burning and the oxygen around it—if the two are separated by such waves, they reasoned, the fire would have to go out. They took the trial-and error approach, aiming speakers at small fires and sending out different types of sound at different frequencies. Ultra-high frequencies did not have much impact, they noted, so they tried going low—in the 30 to 60 Hertz range, and found that it did indeed cause fires to go out.

Encouraged, they took the idea further by building a portable device capable of focusing the pressure waves directly at a fire. In essence, it is composed of an amplifier, a power source and a collimator made out of cardboard tube (for focusing the waves). The result is a reasonably small fire extinguisher that works without the use of water or chemicals. Their initial impulse was to use the extinguisher for small fires in the kitchen, but now believe it may have a far wider use.

The two students acknowledge that there is still a lot of work to do before they will know if their extinguisher might be useful for fighting real fires—thus far, it has only been tested on small alcohol flames. At issue is whether it can be used on bigger fires, and because it does not have a coolant, whether fires that go out, because the material will still be hot, will reignite once the sound waves cease.

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