

Squeezing Out More Bandwidth By Twisting Radio Waves

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As data traffic grows at an increasingly rapid pace, wireless bandwidth is fast becoming a precious commodity. Enter Italian astrophysicist Fabrizio Tamburini and his proposed solution-- one involving "twisting" radio waves.



The idea takes inspiration from the gravity black holes generate-- gravity so immense it causes light waves to twist. In a recent paper, Tamburini shows a means to twist radio waves in a similar way-- creating multiple subfrequencies distinguished by the degree of twistedness.

You can tune the wave with a given frequency as you normally do, but there is also a fingerprint left by the twist," Tamburini says. The twisting method can potentially "squeeze out" 100 times more bandwidth from existing frequencies.

Tamburini and colleague Bo Thidé successfully demonstrated the system last June, with a custom dish setup in Venice broadcasting video encoded in both twisted and normal radio waves across St. Mark's Basin.

The next step? Creating small, cheap antennas transmitting and receiving twisted signals for commercial applications, such as smartphones and other mobile devices.

Go [Radio Beam Vorticity and Orbital Angular Momentum \(Fabrizio Tamburini, Bo Thidé\)](#)