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Superoscillations in waves: old, new, common, uncommon

Abstract. In physics, the mathematical phenomenon of superoscillations is associated with almost-destructive interference, and occurs near phase singularities in optics and on the world's ocean tides; and it is associated with quantum weak measurements. They are a compact way to represent fractals. In light represented by scalar waves, and in many contexts in quantum physics, superoscillations are rather common; but in light represented by electric fields - and more so when magnetic fields are included - they are unexpectedly rare. Superoscillations in red light can escape as gamma radiation.

