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One plus one equals one: The beluga whale (*Delphinapterus leucas*) produces two pulses to form its echolocation click

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Empirical results have shown that two sound generators exist in the nasal system of delphinids. It had been previously assumed that these function independently, with one primarily involved in pulse production and the other in the generation of tonal signals. Here we report that in the beluga whale both generators appear to be simultaneously involved in the production of the echolocation click measured in front of the animal. A study was conducted that examined the propagation of the echolocation click of a captive 12 year-old female beluga whale at 15°, 30°, 45°, 60°, 75° and 90° off the center axis of both sides of the outgoing beam. The results reveal that at angles greater than 30° two distinct pulses are measured that cannot be attributed to multipath reflections from the surface or any structure in the tank. The two pulses are maximally separated in time at 90° off-axis and gradually converge with each 15° measurement closer to the beam center. At 30° the two pulses begin to form a single, albeit distorted pulse. The phenomenon is symmetrical on both sides of the animal. These findings shed new light on how beluga whales and perhaps other odontocetes form their echolocation pulse.