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Experiment links the afterbounce instability and period doubled emission in single-bubble sonoluminescence MOGENS LEVINSEN, Niels Bohr Institute, University of Copenhagen — We report the first direct and long time stable observation for a single sonoluminescing bubble of the afterbounce instability that is believed to be one of the ways for a sonoluminescing bubble to lose stability and eventually break up. Furthermore we show that the instability is directly linked to the curious phenomenon of flash by flash period doubling of the sonoluminescent emission as the afterbounce instability is always period doubled whenever the emission is. This lends credit to a hot core picture coupled with refraction in the surface of the bubble. A theoretical understanding of this peculiar coupling is still missing.

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