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Testing the acoustic tolerance of harbour porpoise hearing for impulsive sounds

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The planned construction of offshore wind turbines in the North and Baltic Seas involves the emission of high numbers of intense impulsive sounds when the foundations of the turbines are being driven into the ground by pile driving. Based on information from other odontocete cetaceans it can be assumed that the source levels which will on average exceed 225 dB re 1 μ Pa pose a risk at least for temporary threshold shift (TTS) on harbour porpoises which inhabit these waters. In order to base the definition of noise exposure criteria on information on the tolerance of the hearing of this species a TTS study was conducted on one of the harbour porpoises held at the Fjord & Bælt in Kerteminde, Denmark. The hearing data were collected by using the AEP method. An airgun was chosen as sound source for the fatiguing sound stimulus to simulate the impulsive sounds at sufficiently high levels. This study comprises the testing of the animals normal hearing sensitivity and subsequent repetitions of these tests after an exposure to single impulsive sounds from the airgun at increasing levels. The baseline hearing data, thresholds for behavioural reactions and the resulting TTS levels will be presented.