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Bursting of a bubble confined in between two plates[1] MAYUKO MURANO, NATSUKI KIMONO, KO OKUMURA, Ochanomizu Univ. — Rupture of liquid thin films, driven by surface tension, has attracted interests of scientists for many years [1-4]. It is also a daily phenomenon familiar to everyone in the form of the bursting of soap films. In recent years, many studies in confined geometries (e.g. in a Hele-Shaw cell) have revealed physical mechanisms of the dynamics of bubbles and drops [5]. As for a liquid film sandwiched in between another liquid immiscible to the film liquid in the Hele-Shaw cell, it is reported that the thin film bursts at a constant speed and the speed depends on the viscosity of the surrounding liquid when the film is less viscous, although a rim is not formed at the bursting tip; this is because the circular symmetry of the hole in the bursting film is lost [6]. Here, we study the bursting speed of a thin film sandwiched between air instead of the surrounding liquid in the Hele-Shaw cell to seek different scaling regimes. By measuring the bursting velocity and the film thickness of an air bubble with a high speed camera, we have found a new scaling law in viscous regime. [1] L. Rayleigh, Nature 44 (1891) [2] F. E. Culick, J. Appl. Phys. 31 (1960) [3] G. Debregeas, P. Martin and F. Brochard-Wyart, Phys. Rev. Lett. 75 (1995) [4] E. Reyssat and D. Quere, Europhys. Lett. 76 (2006) [5] Maria YOKOTA and Ko OKUMURA, Proc. Nat. Acad. Sci. 108 (2011) [6] Ayako ERI and Ko OKUMURA, Phys. Rev. E Rapid Communication, 82 (2010)

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