

# On the Tate and Mumford–Tate conjectures for varieties with $h^{2,0} = 1$

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I will explain my proof of the Tate and Mumford–Tate conjecture for divisor classes on a variety with  $h^{2,0} = 1$  (e.g. surfaces with  $p_g = 1$ ), under a mild assumption on their moduli. The proof involves a combination of several new techniques, including a generalization of the Kuga–Satake construction and a new interpretation of half-twists of CM-Hodge structures. I will start by explaining the method of Deligne–André for K3 surfaces, which is the main source of inspiration for the proof.

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