Electronic Supplementary Material (ESI) for Soft Matter.

Supporting information

Magnetically Stimulating Capillary Effect for Reversible Wet Adhesions

*Meng Li[1], Qingwen Dai[1], Qing Jiao[1], Wei Huang[1], and Xiaolei Wang[1]**

1. National Key Laboratory of Science and Technology on Helicopter Transmission, Nanjing University of Aeronautics & Astronautics, Nanjing 210016, China

*E-mail: wxl@nuaa.edu.cn. Tel/Fax: +86-25-84893630.

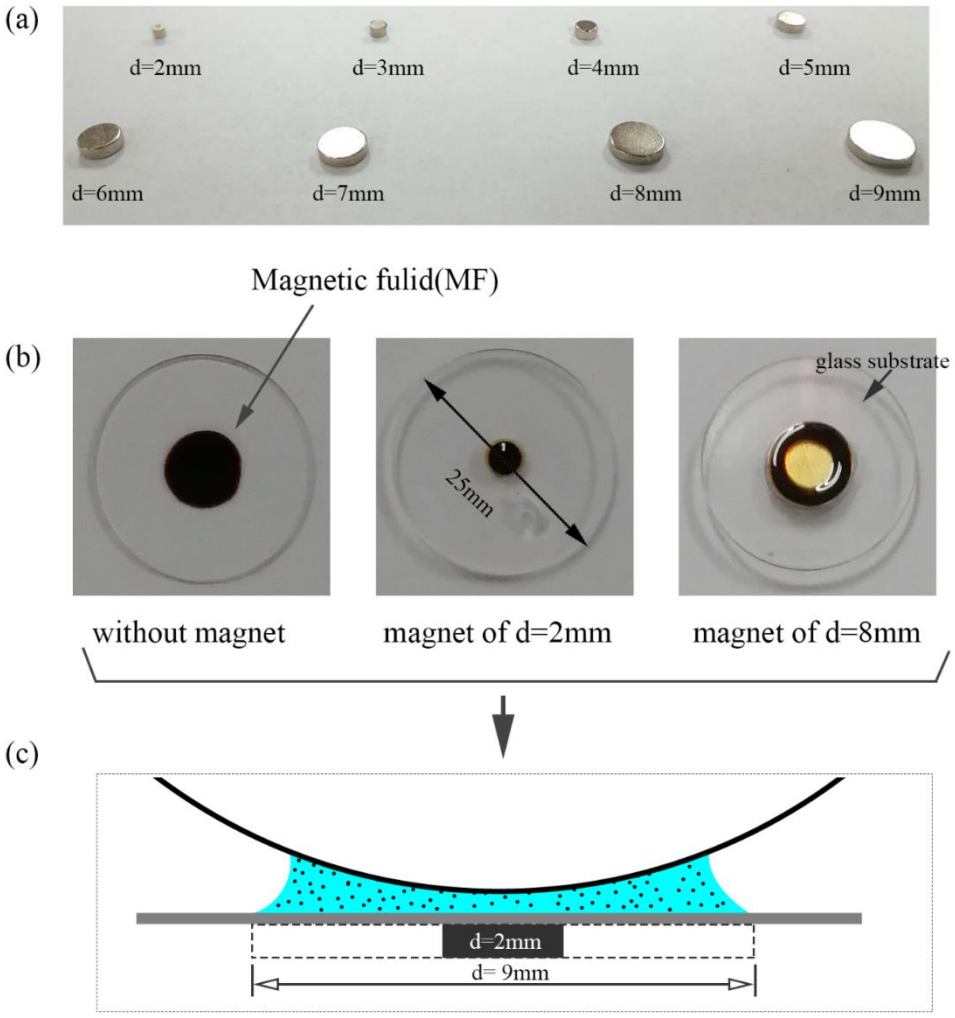

Figure S1. (a) photos of magnets with various diameters used in this work (b) MF drops placed on

SiO_2 substrate with the coin-shaped magnets of d = 0 (namely without magnet), 2, 8mm on the back, (c) capillary meniscus still easily forming with different magnetic stimuli because of the strong capillary effect.

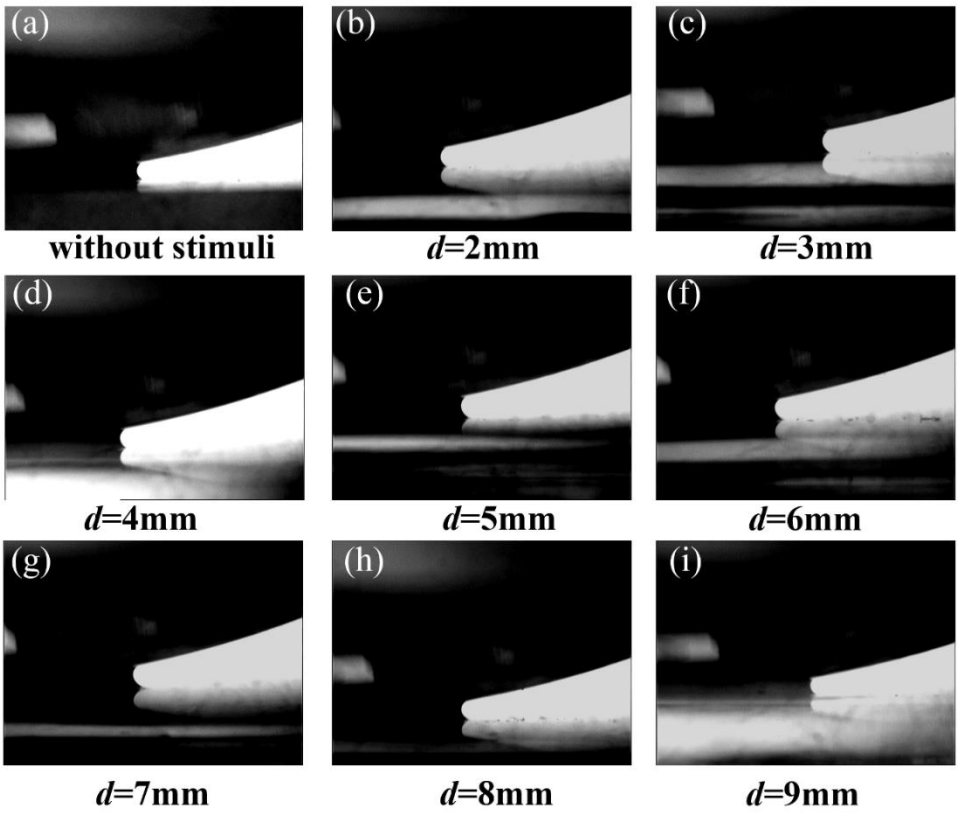

Figure S2. Captured pictures of MF meniscus (5 μl) between probe and substrate using CCD system. (a) MF meniscus without magnetic stimuli, (b-i) with the stimuli of coin-shaped magnets of diameter *d* = 2-9mm.

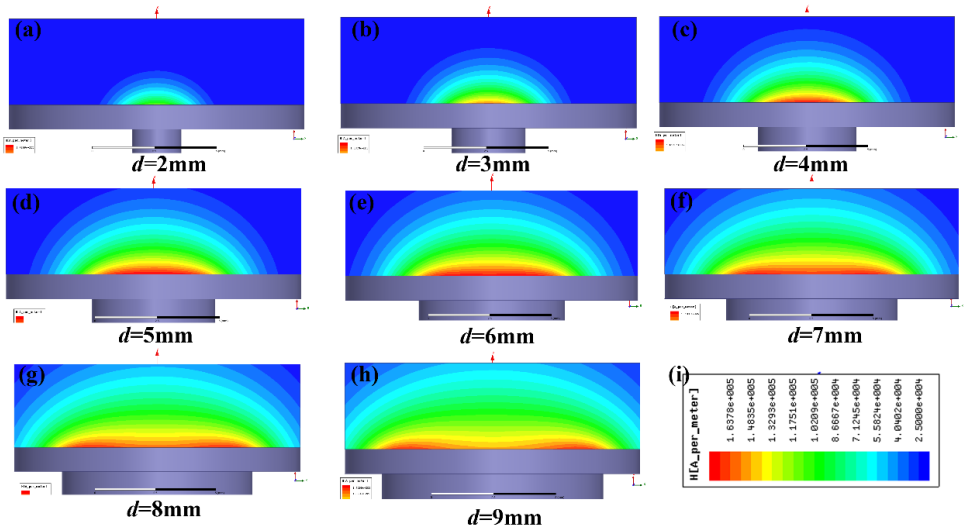

Figure S3. Contours of magnetic field intensities for the magnets of d = 2-9 mm in the half-space above the substrate simulated by Ansoft Maxwell 14.0.

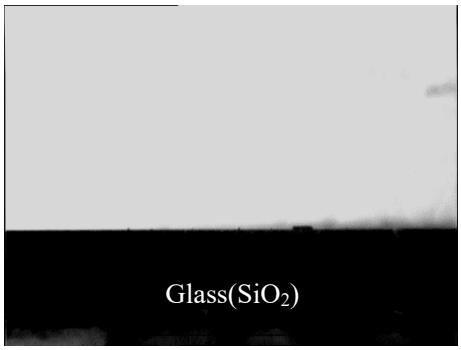

Figure S4. The contact angle measurement of MF (Magnetic fluid, SS-F10A2) droplet with 3 μl on glass (SiO_2) surface. Captured picture suggested that the droplet spreads widely indicating that the static contact angles of θ_1 and θ_2 are nearly zero.

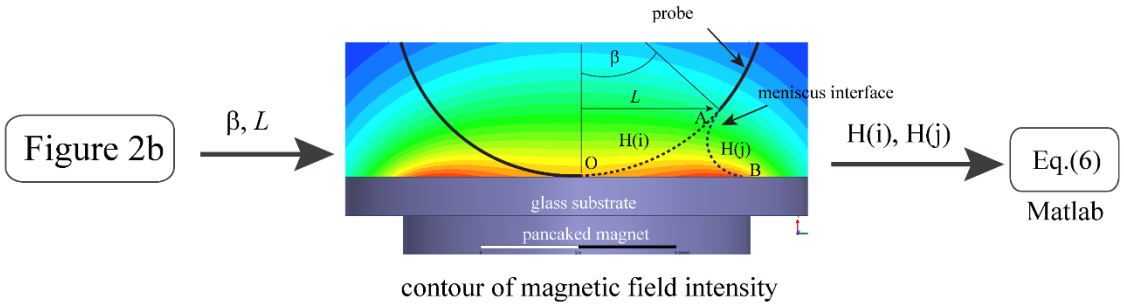

Figure S5. Illustration of the process of theoretically calculating the magnetically stimulated capillary force of MF meniscus. Briefly, based on the filling angle β and radius L for various diameters in figure 2b, we defined the path OA of probe and BA of MF meniscus in the corresponding contour of magnetic field intensity. Then, we extracted the discrete arrays of filed intensities, H(i) of OA and H(j) of BA. Lastly, we calculated the Eq.(6) for theoretical results using the software of Matlab.