Characterizing the aftermath of a medium-sized outburst of Centaur 29P/Schwassmann-Wachmann 1 using HST/WFC3

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Comet 29P/Schwassmann-Wachmann 1 (hereafter, 29P) is a highly active andprominent member of the Centaur population. Centaurs are icy bodies with orbits between Jupiter and Neptune, which dynamically link the Jupiter-family comets to the trans-Neptunian objects of the outer solar system. Hovering at large heliocentricdistances, where the sublimation of water ice is negligible, the mechanism driving the outbursts of comet 29P remains undetermined. We present target of opportunity observations collected with the Hubble Space Telescope (HST) Wide Field Camera 3 (WFC3), acquired following reports of a possible fragmentation event of 29P before Oct. 1.3, 2019 (M.S.P. Kelley, et al., ATEL 13164, 2019). Our observing cadence captured 29P within two days of a 0.9 mag, thus medium-sized outburst, and provided observations before and after the event for context and to probe the development of the ejecta. Between the purported fragmentation event and the HST observations, 29P underwent two small outbursts on Oct. 7 and Oct. 16, 2019 (both of amplitude 0.4-0.5 mag; Q. Z. Ye et al., ATEL 13179, 2019; M. S. P. Kelley, UMD, priv. comm.), followed by a medium-sized outburst with an amplitude of 0.9 mag around Oct. 19.5, 2019 (D. Bodewits, AU; R. Miles, BAA comet section, priv. comm). HST observed 29P three times, on Oct. 14.75, Oct. 20, and Oct. 28.5, 2019. A detailed characterization of the coma morphology, dynamics, and the results of deep, sub-km search for fragments will be provided in our presentation.