Name	$\log M_{\rm BH}<8$ $[M_\odot]$	Hβ<2000 km s^{-1}	Fe II	[OIII]/Hβ < 3 [flux ratio]	$\Delta g-r$ ~ 0 mag	UV	X-ray Γ	W1-W2 >0.7 mag[a]	Re-brighten	Spec. class	Interp.
AT2019brs	×	✓	✓	✓	×	✓	✓[b]	✓	×	HeII+NIII	AGN
AT2019pev	✓	✓	×	✓	✓	✓	3	×	✓	HeII+NIII	AGN
AT2019fdr	✓	✓	✓	✓	×	✓	×	×	×	FeII	TDE
AT2019avd	✓	✓	✓	✓	×	✓	5	×	✓	HeII+NIII	AGN
AT2020hle	✓	✓	×	✓	✓	✓	✓[b]	×	×	HeII	TDE
CSS100217	✓	✓	✓	✓	×	✓	3	✓	×	FeII	AGN
PS16dtm	✓	✓	✓	✓	✓	✓	2[c]	×	×	HeII+FeII	TDE
AT2017bgt	✓	✓	✓	✓	✓	✓	2	×	✓	HeII+NIII	AGN
AT2018dyk	✓	✓	×	✓	×	✓	3	×	×	HeII	AGN
PS1-10adi	✓	✓	✓	✓	✓	✓	✓[b]	×	×	FeII	TDE

Figure 10. Comparison of the properties of individual objects in the sample (upper table) and NLSy1-related transients in the literature (lower table). "✓" means that the property is observed, and "×" indicates that the characteristic was not observed. "UV" refers to the persistence of detected UV emission and "Rebrighten" refers to a significant recovery of at least half the peak luminosity of the source. Following the convention of Figure 7, blue (green) indicates a property associated with the TDE (flaring AGN) scenario. a. We select the less conservative color cut presented in Stern et al. (2012). b. The single low-level XRT detection of AT2019brs and AT2020hle occurred only once throughout the follow-up campaign and was not at a level to take a reliable spectral measurement. Similarly, the late-stage X-ray detection of PS10adi reported in Jiang et al. (2019) was not sufficient to measure the softness of the spectrum. c. The host of PS16dtm displayed X-rays only prior to and following the fading of, but not for the duration of, the transient.

1. "H II only",
2. "H II+N III", and
3. "Fe II only",

and we propose the following naming convention for these classes: "NLSy1-He II", "NLSy1-He II+N III," and "NLSy1-Fe II".[31]

4.4. Physical Interpretation of the Transient Flares

In the following section we consolidate all that is known about the relevant properties of each object in the sample and compare them with the related transients in NLSy1s in the literature to explore each of the following scenarios: a PS16dtm-like TDE in an NLSy1, a Sharov 21–like microlensing event, a CSS100217-like SN in an NLSy1, and a binary SMBH scenario.

4.4.1. Association of the Transients with AGNs

There is evidence that all sources in the sample are associated with AGNs rather than distinct explosive events occurring in a normal galaxy. As evident in Figure 9, the strengths of the Balmer lines in the transient spectra are most consistent with that of an NLSy1. Ne V λ3426, when observable, is typically associated with AGNs and is present in the spectra of these sources. Strong H II profiles, although somewhat rare in association with normal stochastic AGN variability (Neustadt et al. 2020), have been observed before and interpreted as the signature of a sudden enhancement of accretion (e.g., Frederick et al. 2019; Trakhtenbrot et al. 2019a).

Persistent X-rays are a likely signature of accretion onto an SMBH rather than an SN. A strong soft X-ray excess is characteristic of NLSy1s. However, it is typically accompanied by a hard X-ray continuum component (not present in either X-ray-detected transient in this sample) and not nearly as ultrasoft as the X-rays seen in AT2019avd ($4 \lesssim \Gamma \lesssim 6$), which are slopes more frequently observed in the X-ray spectra of TDEs.

Although these outbursts may not necessarily be the result of an intrinsic enhancement in AGN accretion activity, transients with fast-rise/slow-decay (such as those in this sample), along with slow-rise/fast-decay and symmetric light-curve shapes, were well represented in a sample of 51 AGN flares discovered in CRTS (Graham et al. 2017). When taken together, these light-curve shapes can be connected to the ongoing physical and radiative interactions during these accretion events, similarly to TDEs (van Velzen et al. 2021).

4.4.2. The SN Scenario

It is highly improbable that these flares are the result of normal SN explosions. We observe long-lived *U*-band emission in AT2019fdr, persistent UV emission in all transients in the sample, and strong transient X-ray detections in AT2019pev and AT2019avd. There is also only a small likelihood of an SN in the host galaxy along the line of sight unassociated with the AGN. The strongest evidence against the normal SN scenario is the persistence of the H II emission features ∼10–100 days after the onset of the flare—such flash ionization signatures are only visible in SN spectra at very early times (e.g., Khazov et al. 2016; Bruch et al. 2021).

At least one of these transients (AT2019fdr) shares a number of properties with CSS100217, which displayed soft X-rays and was interpreted as an SN IIn explosion in an AGN disk. The SN interpretation of CSS100217 was largely based on light-curve energetics, which are similar to those of this sample. The $g-r$ color change and the peak magnitude of $-23 \lesssim M_V \lesssim -22$ are very similar in particular between CSS100217 and AT2019fdr. Type IIn SNe can exhibit strong Fe II lines in late spectra, such as AT2019fdr did.

However, in contrast, the light-curve evolution differs in that CSS100217 fades at least twice as quickly as AT2019fdr. Also, the Fe II complex of CSS100217 was always visible throughout

[31] We note that although hydrogen features are not explicitly named in this feature classification scheme, all spectra of the transients show resolved narrow (1000 < FHWM < 2000 km s^{-1}) Balmer features (see Section 3.2).