# Catalog of DRAGNs and Single-Component Sources in VLASS

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This catalog is described in full in Gordon et al. (2023, submitted). In this document we outline the data model of the catalog, which consists of two tables. First, a Source Table gives a list of all sources (DRAGNs and single-component source) with some basic source parameters and host information where available. Second, a DRAGN Information Table provides additional data only applicable to the DRAGNs. The column definitions for these tables are given below.

Table 1. Source Table (`sources.fits`) column definitions

| **Column Name** | **Column Description [notes]** | **Units** |
|---|---|---|
| *Name* | Julian name of source (Jhhmmss.ss±ddmmss.s) | |
| *RA* | R.A. of the source | deg |
| *DEC* | Decl. of the source | deg |
| *Flux* | Total flux density of the source | mJy |
| *E_Flux* | Uncertainty in *Flux* | mJy |
| *LAS* | Estimate of the Largest Angular Size of the source | arcsec |
| *E_LAS* | Uncertainty in *LAS* | arcsec |
| *Type* | Type of source [**1**] | |
| *Source_flag* | Source quality flag (> 0 is suspect) [**2**] | |
| *AllWISE* | Name of the AllWISE host ID | |
| *RA_AllWISE* | R.A. of the AllWISE host | deg |
| *DE_AllWISE* | Decl. of the AllWISE host | deg |
| *Sep_AllWISE* | Angular separation between radio source and AllWISE host ID | arcsec |
| *LR* | Likelihood ratio of host ID | |
| *Rel* | Probabilty that the host is correct | |
| *Host_flag* | Host ID flag (> 0 is suspect) [**3**] | |
| *W1mag* | Vega magnitude of AllWISE host in the W1 band | mag |
| *E_W1mag* | Uncertainty in *W1mag* | mag |
| *W2mag* | Vega magnitude of AllWISE host in the W1 band | mag |
| *E_W2mag* | Uncertainty in *W2mag* | mag |
| *W3mag* | Vega magnitude of AllWISE host in the W1 band | mag |
| *E_W3mag* | Uncertainty in *W3mag* | mag |
| *W4mag* | Vega magnitude of AllWISE host in the W1 band | mag |
| *E_W4mag* | Uncertainty in *W4mag* | mag |
| *z* | Host redshift [**4**] | |
| *z_err* | Uncertainty in *z* | |
| *z_type* | Redshift type | |
| *z_survey* | Survey that the redshift was obtained from | |

TABLE 2. DRAGN INFORMATION TABLE (`dragns.fits`) column definitions

| **Column Name** | **Column Description [notes]** | **Units** |
|---|---|---|
| *Name* | Julian name of source (Jhhmmss.ss±ddmmss.s) | |
| *RA* | R.A. of the source | deg |
| *DEC* | Decl. of the source | deg |
| *Flux* | Total flux density of the source | mJy |
| *E_Flux* | Uncertainty in *Flux* | mJy |
| *Core_prom* | Fraction of *Flux* associated with *Core* | |
| *E_Core_prom* | Uncertainty in *Core_prom* | |
| *Lobe_flux_ratio* | Ratio of the flux from *Lobe_1* to the flux from *Lobe_2* | |
| *E_Lobe_flux_ratio* | Uncertainty in *Lobe_flux_ratio* | |
| *LAS* | Estimate of the Largest Angular Size of the source | arcsec |
| *E_LAS* | Uncertainty in *LAS* | arcsec |
| *Misalign_1* | Relative misalignment of *Lobe_1* | deg |
| *E_Misalign_1* | Uncertainty in *Misalign_1* | deg |
| *Misalign_2* | Relative misalignment of *Lobe_2* | deg |
| *E_Misalign_2* | Uncertainty in *Misalign_2* | deg |
| *Mean_misalign* | Mean value of *Misalign_1* and *Misalign_2* | deg |
| *E_Mean_misalign* | Uncertainty in *Mean_misalign* | deg |
| *Lobe_1* | Component name of *Lobe_1* | |
| *Lobe_2* | Component name of *Lobe_2* | |
| *Core* | Component name of *Core* if identified | |
| *RA_core* | R.A. of *Core* | deg |
| *DEC_core* | Decl. of *Core* | deg |
| *RA_median* | Median R.A. of two lobes | deg |
| *DEC_median* | Median Decl. of two lobes | deg |
| *RA_fw* | Flux-weighted central R.A. of two lobes | deg |
| *DEC_fw* | Flux-weighted central Decl. of two lobes | deg |
| *Source_flag* | Source quality flag ($> 0$ is suspect) [**2**] | |
| *AllWISE* | Name of the AllWISE host ID | |
| *Sep_AllWISE* | Angular separation between radio source and AllWISE host ID | arcsec |
| *LR* | Likelihood ratio of host ID | |
| *Rel* | Probabilty that the host is correct | |
| *Host_flag* | Host ID flag ($> 0$ is suspect) [**3**] | |

**Column notes:**

**[1]** 'S': single-component,
'D': DRAGN.

**[2]** 1: *Type*=='D' and $0.1 < Lobe\_flux\_ratio < 10$,
0: All other sources

**[3]** 1: DRAGN where the host and radio core not co-located,
0: DRAGN without a radio core or single-component source,
-1: DRAGN where likelihood ratio host ID has been updated to a host co-located with the radio core,
-2: DRAGN where likelihood ratio host ID is co-located with the radio core.

**[4]** Spectroscopic redshifts are obtained from one of:
- SDSS DR16 (Ahumada et al., 2020),
- 6dFGS (Jones et al., 2009),
- 2MRS (Huchra et al., 2012),
- WiggleZ (Drinkwater et al., 2018),
- 2dFGRS (Colless et al., 2001),
- GAMA DR3 (Baldry et al., 2018),

Photometric redshifts are obtained from the Duncan (2022) catalog of photo-zs in the DESI imaging Legacy Surveys Data Release 8 (LS DR8, Dey et al., 2019).

## References

Ahumada, R., Prieto, C. A., Almeida, A., et al. 2020, ApJS, 249, 3, doi: 10.3847/1538-4365/ab929e

Baldry, I. K., Liske, J., Brown, M. J. I., et al. 2018, MNRAS, 474, 3875, doi: 10.1093/mnras/stx3042

Colless, M., Dalton, G., Maddox, S., et al. 2001, MNRAS, 328, 1039, doi: 10.1046/j.1365-8711.2001.04902.x

Dey, A., Schlegel, D. J., Lang, D., et al. 2019, AJ, 157, 168, doi: 10.3847/1538-3881/ab089d

Drinkwater, M. J., Byrne, Z. J., Blake, C., et al. 2018, MNRAS, 474, 4151, doi: 10.1093/mnras/stx2963

Duncan, K. J. 2022, MNRAS, 512, 3662, doi: 10.1093/mnras/stac608

Huchra, J. P., Macri, L. M., Masters, K. L., et al. 2012, ApJS, 199, 26, doi: 10.1088/0067-0049/199/2/26

Jones, D. H., Read, M. A., Saunders, W., et al. 2009, MNRAS, 399, 683, doi: 10.1111/j.1365-2966.2009.15338.x