Unblinded Data Release for PLAsTiCC

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Here we release the unblinded simulated transient data corresponding to a recent classification challenge known as PLAsTiCC: "Photometric LSST Astronomical Time Series Classification Challenge." The challenge ran on Kaggle[1] from Sep 28 2018 through Dec 17 2018, and a classification science-code competition ran until Jan 15 2019. Here we release the unblinded meta-data files (one row per object), along with the lightcurve data files. The latter are the same as on Kaggle, and are provided here for convenience so that all data can be downloaded from a single repository. In the meta-data, the first ten columns are identical to the columns available during the competition; the remaining 16 columns provide additional information about the true class, redshift, template flux, etc ... For each model, we also provide model-specific parameters used to generate each event; e.g., ejected mass, velocity of explosion debris, etc ... These parameters are intended to help experts evaluate the models, and are not intended to be used for classification.

In the near future, this data release will be associated with an article describing details of the PLAsTiCC models and simulation, and this article will be submitted to a professional astronomy journal.

The released lightcurve files are:

```
plasticc_training_lightcurves.csv      # training set
plasticc_test_lightcurves_01.csv.gz    # test set, DDF only
plasticc_test_lightcurves_02.csv.gz    # test set, WFD subset 1
plasticc_test_lightcurves_03.csv.gz    # test set, WFD subset 2
plasticc_test_lightcurves_04.csv.gz
plasticc_test_lightcurves_05.csv.gz
plasticc_test_lightcurves_06.csv.gz
plasticc_test_lightcurves_07.csv.gz
plasticc_test_lightcurves_08.csv.gz
plasticc_test_lightcurves_09.csv.gz
plasticc_test_lightcurves_10.csv.gz
plasticc_test_lightcurves_11.csv.gz   # test set, WFD subset 10
```

[1] https://www.kaggle.com/c/PLAsTiCC-2018

The lightcurves are split into 12 separate files for download convenience. The meta-data files with unblinded information are

```
plasticc_train_metadata.csv.gz   # training set
plasticc_test_metadata.csv.gz    # test set
```

and columns are described below in the Appendix. For 3 of the 18 models, the "true_submodel" index distinguishes independently developed models for the same class:

true submodel	true_target = 42 (SNII)	62(Ibc)	06(uLensSingle)
1	SNII-Templates	Ibc-Templates	pyLima
2	SNII-NMF	Ibc-MOSFIT	GenLens
3	SNIIn-MOSFIT	---	---

These sub-models will be described in detail in the journal article.

Finally, "plasticc_modelpar.tar" contains a separate csv file for each model, and includes physical parameters specific to each model. A description of these parameters will be provided later when the model libraries are released with the journal article.

To stay informed about PLAsTiCC articles, data products, and other events, please see

https://plasticc.org

Appendix Below is a description of the 26 columns in the meta-data files

```
plasticc_train_metadata.csv
plasticc_test_metadata.csv
```

Note that the first 10 columns are identical to those provided during the competition.

```
    name            : description
# ---------------------------------------------------
object_id           : Unique object identifier (integer32)
ra                  : right ascension, degrees (float32)
decl                : declination, degrees (float32)
ddf_bool            : boolean flag: 1 for DDF, 0 for WFD
hostgal_specz       : accurate spec-redshift for small subset (float32)
hostgal_photoz      : photometric host-redshift (float32)
hostgal_photoz_err  : uncertainty on photometric host-redshift (float32)
distmod             : distance modulus computed with hostgal_photoz (float32)
mwebv               : Galactic E(B-V) extinction (float32)
target              : integer model class during challenge (0 for test set)
true_target         : integer model class for all objects (post-challenge)
true_submodel       : sub-model type for independently-developed models
true_z              : true redshift, cmb frame (float32)
true_distmod        : true distance modulus (float32)
true_lensdmu        : mag shift from weak lensing (float32)
true_vpec           : host galaxy peculiar velocity, km/sec (float32)
true_rv             : RV for host galaxy exinction (float32)
true_av             : AV for host galaxy exinction (float32)
true_peakmjd        : true MJD-time of peak brightness (float32)
libid_cadence       : integer LIBID of observation library (i.e., SIMLIB file)
tflux_u             : Template source-flux for band = u (float32)
tflux_g             : Template source-flux for band = g (float32)
tflux_r             : Template source-flux for band = r (float32)
tflux_i             : Template source-flux for band = i (float32)
tflux_z             : Template source-flux for band = z (float32)
tflux_y             : Template source-flux for band = y (float32)
# ---------------------------------------------------
```

The lightcurve files are described below.

```
Lightcurve columns:
    name            : description
# ------------------------------------------------------
object_id      : unique object identifier (integer)
mjd            : modified julien date (float)
passband       : passband integer with 0,1,2,3,4,5  --> u,g,r,i,z,y
flux           : measured flux (float), corrected for Galactic extinction.
                 Flux zeropoint=27.5.
flux_err       : uncertainty on the flux listed above (float).
detected_bool  : 1 = detection from image-subtraction pipeline
```

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