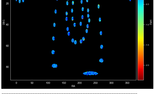
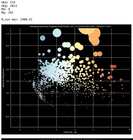
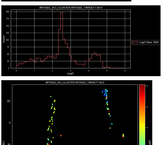
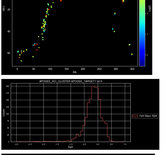
```
Python 3.7.6 (default, Jan 28 2020, 07:20:00)
[GCC 7.3.0] :: Anaconda custom (64-bit) on linux.
Type "help", "copyright", "credits" or "license" for more information.
IPython 7.12.0 -- An enhanced Interactive Python.
In [1]: runfile('/Users/jsunpharma/scripts/Apogee Rb Target Program MS.py', wdir='/Users/jsunpharma/scripts')
/Users/jsunpharma/scripts/astroutils/bjutilities

Index: APOGEE_TARGETS to APOGEE_TARGET2

APOGEE_TARGETS_bits
APOGEE_SEC_BOSS APOGEE_TARGETS bit 0 , 'APOGEE_TARGETS', 1)
APOGEE_SEC_BOSS APOGEE_TARGETS bit 1 , 'APOGEE_TARGETS', 2)
APOGEE_APO_BOSS APOGEE_TARGETS bit 2 , 'APOGEE_TARGETS', 4)
APOGEE_LCO_BOSS APOGEE_TARGETS bit 3 , 'APOGEE_TARGETS', 8)
APOGEE_APO1M APOGEE_TARGETS bit 4 , 'APOGEE_TARGETS', 16)
APOGEE_LCO1M APOGEE_TARGETS bit 5 , 'APOGEE_TARGETS', 32)
APOGEE_ECLIPSE APOGEE_TARGETS bit 6 , 'APOGEE_TARGETS', 64)
APOGEE_RV APOGEE_TARGETS bit 7 , 'APOGEE_TARGETS', 128)
APOGEE_SECONDARY APOGEE_TARGETS bit 8 , 'APOGEE_TARGETS', 256)
APOGEE_TELLURIC APOGEE_TARGETS bit 9 , 'APOGEE_TARGETS', 512)
APOGEE_SEC_BOSS_FAINT APOGEE_TARGETS bit 10 , 'APOGEE_TARGETS', 1024)
APOGEE_SEC_BOSS_FAINT APOGEE_TARGETS bit 11 , 'APOGEE_TARGETS', 2048)
APOGEE_APO1M_FAINT APOGEE_TARGETS bit 12 , 'APOGEE_TARGETS', 4096)
APOGEE_LCO1M_FAINT APOGEE_TARGETS bit 13 , 'APOGEE_TARGETS', 8192)
APOGEE_SEC_BOSS_BRIGHT APOGEE_TARGETS bit 14 , 'APOGEE_TARGETS', 16384)
APOGEE_APO1M_BRIGHT APOGEE_TARGETS bit 15 , 'APOGEE_TARGETS', 32768)
APOGEE_LCO1M_BRIGHT APOGEE_TARGETS bit 16 , 'APOGEE_TARGETS', 65536)
APOGEE_SEC_BOSS_FIBER APOGEE_TARGETS bit 17 , 'APOGEE_TARGETS', 131072)
APOGEE_APO1M_FIBER APOGEE_TARGETS bit 18 , 'APOGEE_TARGETS', 262144)
APOGEE_LCO1M_FIBER APOGEE_TARGETS bit 19 , 'APOGEE_TARGETS', 524288)
APOGEE_SEC_BOSS_FAINT_FIBER APOGEE_TARGETS bit 20 , 'APOGEE_TARGETS', 1048576)
APOGEE_APO1M_FAINT_FIBER APOGEE_TARGETS bit 21 , 'APOGEE_TARGETS', 2097152)
APOGEE_LCO1M_FAINT_FIBER APOGEE_TARGETS bit 22 , 'APOGEE_TARGETS', 4194304)
APOGEE_SEC_BOSS_BRIGHT_FIBER APOGEE_TARGETS bit 23 , 'APOGEE_TARGETS', 8388608)
APOGEE_APO1M_BRIGHT_FIBER APOGEE_TARGETS bit 24 , 'APOGEE_TARGETS', 16777216)
APOGEE_LCO1M_BRIGHT_FIBER APOGEE_TARGETS bit 25 , 'APOGEE_TARGETS', 33554432)
APOGEE_RV_MONITOR APOGEE_TARGETS bit 26 , 'APOGEE_TARGETS', 67108864)
APOGEE_SOLAR_SYSTEM APOGEE_TARGETS bit 27 , 'APOGEE_TARGETS', 134217728)
APOGEE_DELTA_RV_FIRST APOGEE_TARGETS bit 31 , 'APOGEE_TARGETS', 2147483648)


APOGEE_TARGETS_bits

Bit Name          Binary Digit  Description
----- ----------- ------------- -----------
APOGEE_SEC_BOSS   2             Star selected in Secondary Sample of cohort
APOGEE_APO1M      4             Star selected in Apo1m Sample of cohort
APOGEE_LCO1M      8             Star selected in Las1m Sample of cohort
APOGEE_RV         128           Star selected for RV Monitoring or Astrometry
APOGEE_SECONDARY  256           Secondary target not in primary sample
APOGEE_TELLURIC   512           Star selected for telluric RV determination
APOGEE_SOLAR_SYSTEM 134217728   Star selected for Solar System observations
APOGEE_DELTA_RV_FIRST 2147483648 Star selected for first epoch RV monitoring(DR16 phenometry
APOGEE_SEC_BOSS_FAINT 1024      Secondary sample fainter cluster members
APOGEE_APO1M_FAINT 4096         Apo1m sample fainter cluster members
APOGEE_SAMPLE     511           Short cohort target
APOGEE_FAINT      7168          Long cohort fainter target
APOGEE_BRIGHT     57344         Long cohort brighter star
----- ----------- ------------- -----------
APOGEE_UNPROBTARGETS 31         Spectrographic unselected target for RV observ
APOGEE_BLUE       32            Blue selected target
APOGEE_COLORBLIND 64            Non selection program specific target specified in other bits, see below
APOGEE_SEC_BOSS_FIBER 131072    Secondary sample fiber
APOGEE_MEMBER     16            M Member star selected for RV/Metallicity program (ancillary)
APOGEE_CLUSTER    32            Star in a cluster (ancillary)
APOGEE_CALIBRATION 128          Calibration star (ancillary)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_DUPLICATE  16            Duplicating Science star from Apo1m (ancillary)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_MEMBER     16            M Member star (ancillary)
APOGEE_CLUSTER    32            Star in a cluster (ancillary)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_CHECKED    31            This object was checked for APOGEE target selection.


APOGEE_TARGETS_bits

Bit Name          Binary Digit  Description
----- ----------- ------------- -----------
APOGEE_UNPROBTARGETS 31         Spectrographic unselected target for RV observ
APOGEE_COLORBLIND 64            Non selection program specific target specified in other bits, see below
APOGEE_SEC_BOSS_FIBER 131072    Secondary sample fiber
APOGEE_MEMBER     16            M Member star selected for RV/Metallicity program (ancillary)
APOGEE_CLUSTER    32            Star in a cluster (ancillary)
APOGEE_CALIBRATION 128          Calibration star (ancillary)
APOGEE_DUPLICATE  16            Duplicating Science star from Apo1m (ancillary)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_SEC_BOSS   2             Secondary sample (cohort target)
APOGEE_CHECKED    31            This object was checked for APOGEE target selection.


APOGEE_TARGETS_bits1 to APOGEE_TARGETS_bits2
Star selected using Kitt Peak dereddening

Fields: ['BMAG:20' 'BMAG:30' 'BMAG:40' 'BMAG:50' 'BMAG:60' 'BMAG:70' 'BMAG:80'
'BMAG:90' 'BMAG:100' 'BMAG:110' 'BMAG:120' 'BMAG:130' 'BMAG:140' 'BMAG:150'
'BMAG:160' 'BMAG:170' 'BMAG:180' 'BMAG:190' 'BMAG:200' 'BMAG:210' 'BMAG:220'
'BMAG:230' 'BMAG:240' 'BMAG:250' 'BMAG:260' 'BMAG:270' 'BMAG:280' 'BMAG:290'
'BMAG:300' 'BMAG:310' 'BMAG:320' 'BMAG:330' 'BMAG:340' 'BMAG:350' 'BMAG:360'
'BMAG:370' 'BMAG:380' 'BMAG:390' 'BMAG:400' 'BMAG:410' 'BMAG:420'
```

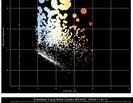


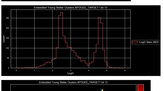
```
==========================================================================

[ APOGEE_NB_DERED APOGEE_TARGET1 bit 9 ], APOGEE_TARGET1, 1)

APOGEE_TARGET1_bit_9

APOGEE_TARGET1_bit_9 = APOGEE_NB_DERED

Star selected using no dereddening

Fields: [ "DEBD-000-1" "DEBD-001" "DEBD-002" "DEBD-003" "DEBD-005-01" "DEBD-006"
"DEBD-007" "DEBD-017" "DEBD-018" "DEBD-020" "DEBD-021" "DEBD-022" "DEBD-023"
"DEBD-024" "DEBD-025" "DEBD-026" "DEBD-027" "DEBD-028" "DEBD-029" "DEBD-030"
"DEBD-031" "DEBD-032" "DEBD-033" "DEBD-034" "DEBD-035" "DEBD-036" "DEBD-037"
"DEBD-038" "DEBD-039" "DEBD-040" "DEBD-041" "DEBD-042" "DEBD-043" "DEBD-044"
"DEBD-045" "DEBD-046" "DEBD-047" "DEBD-048" "DEBD-049" "DEBD-050" "DEBD-051"
"DEBD-052" "DEBD-053" "DEBD-054" "DEBD-055" "DEBD-056" "DEBD-057" "DEBD-058"
"DEBD-059"
```

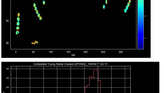


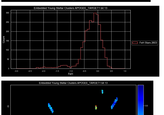


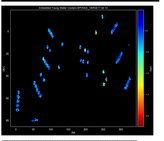


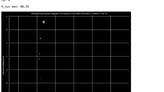


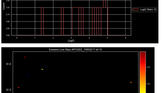


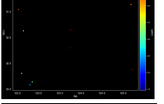


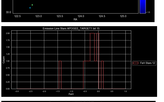


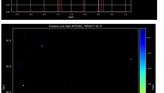


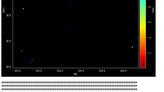


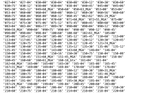


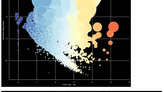


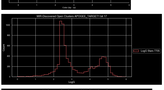


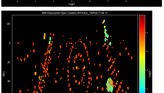


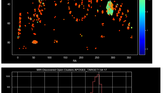


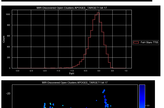


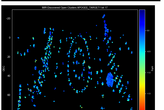


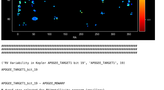


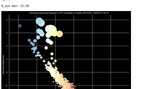


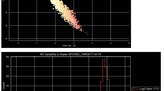












☆Crescent Line Data APOGEE_TARGET1 bit 17, 'APOGEE_TARGET1', 131

APOGEE_TARGET1_bit_17

APOGEE_TARGET1_bit_18 = APOGEE_SEMAGORCYYSGS

Semaphoros interesting target to re-observe

Fields: [1]
Stars: 12

mock_sequence: 1
subpoints: 4
subfields: 1
red_clump: 0
red_giants_binary: 0
red_giants: 0
red_giants_binary: 0

Mag: 0
Mag: 0
Mag: 0
Mag: 0
Mag: 0

H_par max: 00.30

☆TESS-Discovered Open Clusters APOGEE_TARGET1 bit 17, 'APOGEE_TARGET1', 171

APOGEE_TARGET1_bit_17

APOGEE_TARGET1_bit_17 = APOGEE_BACCLUSM

RGB-Discovered Open Clusters

Stars 12NB

PI: M. Meyden (Pontificia/BCIU and U. Zyuwawi University of Utah)

Spectra for candidate cluster members associated with newly discovered or unstudied open clusters in the outer Milky Way disk

While not designing significantly to assess from the open cluster target selection algorithm and goals of the main APOGEE sample, the APOGEE spectroscopic survey has observed a large number of stellar spectra associated with open clusters in the outer Galaxy, including the cluster discoveries by the multi-band Gaia/Pan-STARRS survey (Meyden et al. 2021).
Although the sample of open clusters in the outer Galaxy is still relatively small, this study had been made to determine the clusters' basic parameters, or anything studies had produced conflicting results.

Cluster candidates were selected from the Gaia/Pan-STARRS survey based on their high-resolution imaging (Meyden et al. 2021b). Cluster candidates were also selected from the Gaia/Pan-STARRS survey based on both the lack of existing information and existing with already-planned APOGEE fields in the outer disk.
Spectroscopic data for the outer disk clusters were included in the DR16 public source catalog by application of a K2C2 membership filter (Meyden et al. 2021).

Cluster candidates in the Gaia/Pan-STARRS survey based on their relative position in the RGB CMD and the APOGEE filter collision cadence. Targets were selected for APOGEE spectroscopy based on their relative position in the RGB CMD and the APOGEE filter collision cadence.
Cluster candidates were also selected from the Gaia/Pan-STARRS survey based on both the lack of existing information and existing with already-planned APOGEE fields in the outer disk.

In addition to their selection based on membership and location in the CMD, all of the approximately 12 targets per cluster were constrained to have
photometric uncertainties in G,R,I,Z, and J0.515 of at most 0.5 mag. The final cluster list for this program includes FSR 0494 and FSR 0663.
Meyden et al. (2021), Cantat-Gaudin et al. (2020), Bell et al. (2017), Cantat & Rempt (2021), and SIMBAD/WEBDA (Meyden et al. 2021).

Fields: [1]
Stars: 12

mock_sequence: 1
subpoints: 4
subfields: 1
red_clump: 0
red_giants_binary: 0
red_giants: 0
red_giants_binary: 0

Mag: 0
Mag: 0
Mag: 0
Mag: 0
Mag: 0

H_par max: 0.00.00

☆TM Variability on Kepler APOGEE_TARGET1 bit 17, 'APOGEE_TARGET1', 131

APOGEE_TARGET1_bit_17

APOGEE_TARGET1_bit_18 = APOGEE_RDWARF

A dwarf star selected for Microvariability program (ancillary)

M-Variability in Kepler

Stars 12NB

PI: S. Mahadevan (Penn State University)

Probing Binarity, Elemental Abundances, and Future Positions Among the Kepler Planet Hosts

This ancillary project has observed 230 Kepler Objects of Interest (KOI), identified from the Q1-Q16 data, in Kepler mission 16 at high cadence (1 minute).
A particular M dwarfs to study binarity, abundances, and future positions in the planet host sample.
Binarity is a key parameter in understanding the formation and evolution of planetary systems. Binary stars, especially false positives, present problems for astronomers. Stellar abundances and future positions are also important for planet host stars.
The program also includes 18 M dwarfs and 20 A-F stars observed in the Kepler field, from the Kepler Input Catalog (KIC).
The KOI selection bias is affected by any object with periodic photometric behavior that could be caused by transiting planets, binary stars, or stellar variability. Binarity is a key parameter in understanding the formation and evolution of planetary systems.
Binarity is also important for stellar abundances and future positions of the host stars.
The Kepler mission was designed to detect Hot Jupiters and Hot Neptunes. Cool Jupiters, Cool Neptunes, and Cool Earths are the 3 degree 3000 plane field of view.

Binarity Binarity
Binarity is a key parameter in understanding the formation and evolution of planetary systems, and classified as having a "detached morphology" as listed in the catalogs of Ofek et al. (2011) and Simonian et al. (2012).
Binarity is also important for stellar abundances and future positions of the host stars from Gaertner et al. (2012).

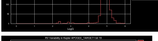
M Dwarfs
A sample of M dwarfs were drawn from the catalog of Binarity & Chemistry (2012) with TMT> 2000 K and d < 10 mag.
Binarity is also important for stellar abundances and future positions of the host stars observed by Kepler, typically of spectral types M2 and later.

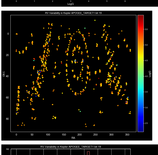
Fields: [1]
Stars: 12

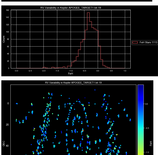
mock_sequence: 1
subpoints: 4
subfields: 1
red_clump: 0
red_giants_binary: 0
red_giants: 0
red_giants_binary: 0

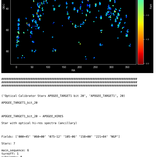
Mag: 0
Mag: 0
Mag: 0
Mag: 0
Mag: 0

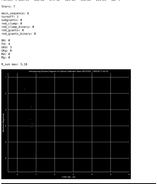
H_par max: 15.30

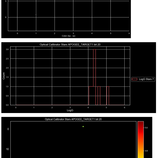


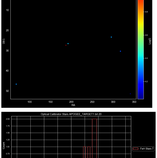


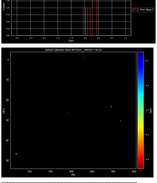


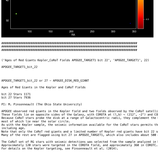


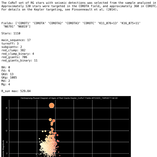


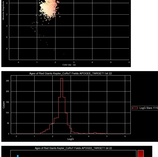


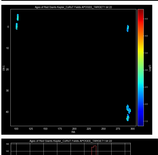


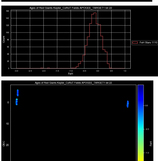


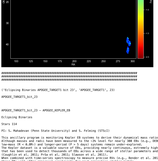


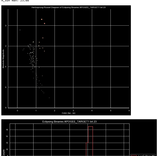


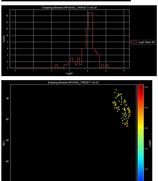


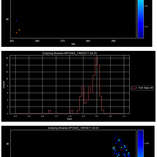


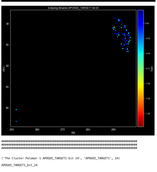












[Optional Calibrator Stars APOGEE_TARGET1 bit 20', 'APOGEE_TARGET1', 20]

APOGEE_TARGET1_bit_20

APOGEE_TARGET1_bit_20 - APOGEE_KOWES

Star with optical hi-res spectra (ancillary)

Fields: 2'3000-4M5' '00h44m0' '075:12' '2M3-4M' '22h44m' '12:14:6' 'NGC7'

Stars: 0

main_properties: 0
kepmag: 0
kepkamm: 0
teff_spec: 0
teff_ipmg_trainer: 0
teff_ipmg: 0
teff_gaiaeb_binary: 0

NH: 0
AV: 0
dmin: 0
dmax: 0
Mg: 0
Mg: 0

N_star_max: 3.10

[Ages of Red Giants Kepler/LaPalf Fields APOGEE_TARGET1 bit 23', 'APOGEE_TARGET1', 23]

APOGEE_TARGET1_bit_23

APOGEE_TARGET1_bit_23 - APOGEE_DEVA_RED_GIANT

Ages of Red Giants in the Kepler and LaPalf Fields.

bit 23 Stars 1670
bit 23 Stars 7836

PI: M. Pinsonneault (The Ohio State University)

APOGEE observed red giants in the Kepler Field and two fields observed by the LaPalf satellite (Anglada et al. 2004). Ages for these red giants will be determined using the Yale Rotation Code (Pinsonneault et al. 1989; Pinsonneault et al. 1998). Because LaPalf stars probe the sun at a range of galactocentric radii, they complement the Kepler sample stars, which are all at the same galactocentric radius.
By with the Kepler sample, the seismic information available for the LaPalf stars permits the determination of fundamental stellar parameters, including ages.
The LaPalf stars are of intermediate mass with M in approximate range 1.5-2.5 Msun, and will provide data on the mass dependence of the age-rotation relation. Ages for these stars will be compared with stellar evolutionary models.
The LaPalf set of RG stars with seismic detections was selected from the sample analyzed in Mosser et al. (2010). Observations of the Kepler sample will be carried out in the APOGEE-Kepler Ancillary RGB of COROT-Seismic Survey in the Kepler targeting, see Pinsonneault et al. (2011).

Fields: '2COROT1' '19h50' '+20d24m' '19h50m12' '+20d25' '6h1_8/8:12' '6:12_8/7:11' '7h50' '+20d24'

Stars: 0

main_properties: 0
kepmag: 0
kepkamm: 0
teff_spec: 0
teff_ipmg_trainer: 0
teff_ipmg: 0
teff_gaiaeb_binary: 0

NH: 0
AV: 0
dmin: 0
dmax: 0
Mg: 0
Mg: 0

N_star_max: 529.00

[Eclipsing Binaries APOGEE_TARGET1 bit 25', 'APOGEE_TARGET1', 25]

APOGEE_TARGET1_bit_25

APOGEE_TARGET1_bit_25 - APOGEE_ECLIP_EB

Eclipsing Binaries

Stars 164

PI: D. Nataraja (Ohio State University) and S. Felzing (OTSU)

This ancillary program is monitoring Kepler EB systems to derive their dynamical mass ratios.
Kepler EB systems are ideal for measuring stellar masses and radii (Torres & Ge 2006; Hu & Ge 2009).
Surveys TM-4 (B.Mtr) and longer-period (P > 5 days) systems remain underrepresented.
Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010). They have yielded to direct measures of the mass-radius relationship of stellar parameters and orbital periods.
Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010). When combined with time-series spectroscopy to measure precise RVs (e.g., Bender et al. 2012), Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010).
See Fielding et al. (2013) for some published results.

The sample of Kepler EBs comes from the catalogue of Prsa et al. (2011) and Slawson et al. (2011) and Kepler Eclipsing Binary Catalog (Slickard et al. 2010). Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010). By design, the target selection ensures a wide range of orbital periods and eccentricities.
Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010).
The sample targets are limited to EBs with V < 11.8 mag (bright and classified as having a "detached morphology" in the Kepler EB catalogue. Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010). Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010).
Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010). Kepler EB systems are ideal for measuring stellar masses and radii because they are primarily high-precision photometry (Slickard et al. 2010).
Cohorts of ecl. 2010 are included in analysis calibrators.

Fields: '2'KIL_B7/10/8' '6h22h' '00:00' '6h22h' '00:00:0'

Stars: 164

main_properties: 25
kepmag: 0
kepkamm: 0
teff_spec: 0
teff_ipmg_trainer: 0
teff_ipmg: 0
teff_gaiaeb_binary: 0

NH: 0
AV: 0
dmin: 0
dmax: 0
Mg: 0
Mg: 0

N_star_max: 25.00

[The Cluster Parallaxes 1 APOGEE_TARGET1 bit 26', 'APOGEE_TARGET1', 26]

APOGEE_TARGET1_bit_26

APOGEE_TARGET1_bit_26 - APOGEE_OC_PAL1

The Cluster Parallaxes 1

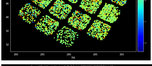
Stars 300

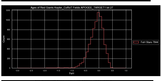
PI: Jo Ivans

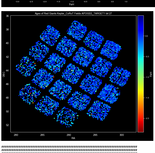
Jo Ivans & Karen. Astrophysics cause globular clusters that may be associated with the Monoceros Ring or

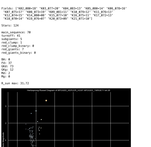
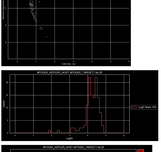
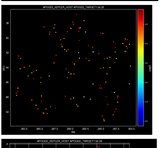
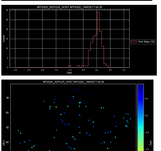
Galactic Anti-center Stellar Stream Discovering at z= 1000kpc Trace an of LAMOST,
Galactic anti-center stellar stream discovered in the LAMOST survey Xiaoting Fan, Haibo Yuan, Chengqian Li et al. 2022
Made a good assessment for a recently reported quasi-stellar overdensity undergoing disruption by the M31 Map.
Galactic anti-center stellar stream discovered in the LAMOST survey Xiaoting Fan, Haibo Yuan, Chengqian Li et al. 2022
Sparse clusters, with the gaps of highly overcrowding the cluster's sensitivity and exploring.
Galactic anti-center stellar stream discovered in the LAMOST survey

The cluster targets were selected with a combination of SMOG and GAS photometry.
The initial selection comprised SMOG stars less than 0# arcsec from the cluster center
Galactic anti-center stellar stream discovered in the LAMOST survey
Galactic anti-center stellar stream
Galactic anti-center stellar stream
Galactic anti-center stellar stream








```
****************************************************************************

* OPTIONS_ASPCOR_ASCI ASPCOR_TARGETS ksi 20', 'APOGEE_TARGETS', 20)

APOGEE_TARGETS_ksi_20

APOGEE_TARGETS_ksi_20 = APOGEE_ASPCOR_ASCI

Applies aspect-bias program target flux

Fields: ['SEC_ERR=20' 'SEC_ETA=20' 'SEC_RES=20' 'SEC_ERR=20' 'SEC_ETA=20'
'SEC_RES=20' 'SEC_ERR=20' 'SEC_ETA=20' 'SEC_RES=20' 'SEC_ERR=20'
'SEC_ETA=20' 'SEC_RES=20' 'SEC_ERR=20' 'SEC_ETA=20' 'SEC_RES=20']

Stars: 240

main_separator: 70
hasspec: 0
hasphot: 0
rmf_index: 0
rmf_quality_factor: 0
rmf_separator: 0
rmf_quality_factor: 0

Dec: 0
Ra: 0
dec: 0
Mag: 0
ra: 0
Mu: 0

R_par_max: 30.72













```
****

* OPTIONS_FLENP_EXTRA APOGEE_TARGETS ksi 20', 'APOGEE_TARGETS', 20)

APOGEE_TARGETS_ksi_20

APOGEE_TARGETS_ksi_20 = APOGEE_FLENP_EXTRA

Selected as faint target for low target density field

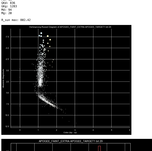
Fields: ['DB=0&DB' 'DB&(T1 '&(Ks&(H '&(Ks&(J1 '&(Ks&(J '&(Ks&(H '&(Ks&(H'
'&(Ks&(J_ext '&(Ks&(J '&(Ks&(H '&(J1&(H '&(Ks&(J '&(Ks&(J'
'&(Ks&(H '&(Ks&(J '&(Ks&(H '&(Ks&(J '&(Ks&(H '&(Ks&(J'
'(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H'
'(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H'
'(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H'
'(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H'
'(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H'
'(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H'
'(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H '(J&(H']

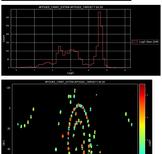
Stars: 2246

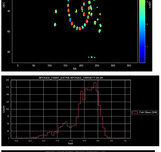
main_separator: 900
hasspec: 0
hasphot: 0
rmf_index: 0
rmf_quality_factor: 0
rmf_separator: 0
rmf_quality_factor: 0

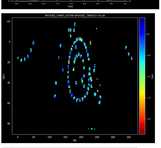
Dec: 0
Ra: 0
dec: 0
Mag: 0
ra: 0
Mu: 0

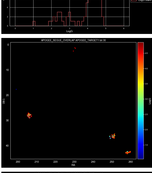
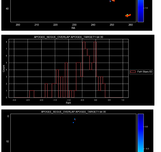
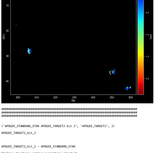
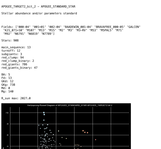
R_par_max: 360.87









```
****************************************************************************

* OPTIONS_SIGGR_DIRPLAN APOGEE_TARGETS ksi 20', 'APOGEE_TARGETS', 20)

APOGEE_TARGETS_ksi_20

APOGEE_TARGETS_ksi_20 = APOGEE_SIGGR_DIRPLAN

Selected because of overlap with SDSS survey

Fields: ['MCI' 'MCI' 'MCI-BS' 'MCI' 'MCI&(J' 'MCI']

Stars: 43

main_separator: 95
hasspec: 0
hasphot: 0
rmf_index: 0
rmf_quality_factor: 1
rmf_separator: 0
rmf_quality_factor: 0

Dec: 0
Ra: 0
dec: 0
Mag: 0
ra: 0
Mu: 0

R_par_max: 1877.38
















```
****

* OPTIONS_STANDARD_STAR APOGEE_TARGETS ksi 1', 'APOGEE_TARGETS', 2)

APOGEE_TARGETS_ksi_2

APOGEE_TARGETS_ksi_2 = APOGEE_STANDARD_STAR

Similar abundance and/or parameters standard

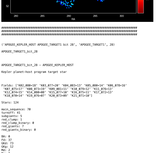
Fields: ['DB&B-BA' 'DB&(B1' 'MKI&(B1' 'MKI&(B&B_BA1.0&' 'DB&A&(B&B_BMA-B1' 'GALCON'
'&(J_MI&(J&' 'MKI' 'MKI' 'MKI' 'MKI' 'MKI' 'MKI' 'MKI' 'MKI' 'MKI'
'MKI' 'MKI&(' 'MKI&(' 'MKI&(']

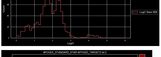
Stars: 9882

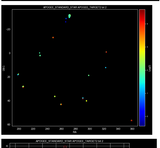
main_separator: 13
hasspec: 0
hasphot: 0
rmf_index: 0
rmf_quality_factor: 2
rmf_separator: 0
rmf_quality_factor: 0

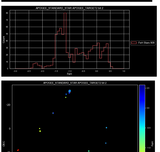
Dec: 0
Ra: 0
dec: 0
Mag: 0.58
ra: 0
Mu: 0

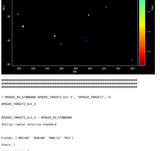
R_par_max: 2627.8



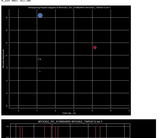


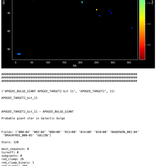







```
================================================================

================================================================

> APOGEE_DR_STANDARD APOGEE_TARGETS bit 2', 'APOGEE_TARGETS', 2)

APOGEE_TARGETS_bit_2

APOGEE_TARGETS_bit_2 = APOGEE_DR_STANDARD

Stellar radial velocity standard

Fields: ['BRIGHT', 'DEBLAND', 'BAD_IR', 'MED']

Shape: 2

main_sequence: 2
giants: 0
subgiants: 0
dwarfs: 2
red_clump_giants: 0
bad_gravity: 0
red_giants_binary: 0

Dec: 0
Gal: 0
ASPCAP: 0
Gaia: 0
MW: 0
Mag: 0

N_sum_max: 3217.00
```





==========

['APOGEE_BALGE_GIANT-APOGEE_TARGET2 bit 11', 'APOGEE_TARGET2', 11]

APOGEE_TARGET2_bit_11

APOGEE_TARGET2_bit_11 - APOGEE_BALGE_GIANT

Probable giant star in Galactic bulge

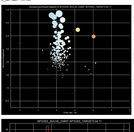
Fields: ['2M00:00:00', '001:02', '2M00:00', '011:00', '0'10:00' '010:00' 'NGC6528_001:00' 'NGC6528_000:00' 'GALCON']

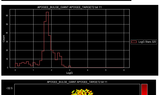
Stars: 330

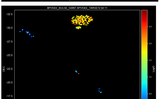
mean_separation: 0
mean_weight: 0
subgiants: 0
giants: 330
red_clump_giants: 1
rc_giants_fraction: 0
red_giants_fraction: 10

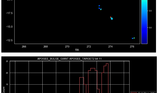
Dec: 0
Dec: 0
Dec: 0
Dec: 0
Dec: 0

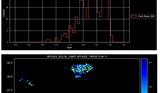
N_sum Dec: 737.00

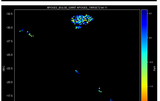












==========

['APOGEE_BALGE_SUPER_GIANT-APOGEE_TARGET2 bit 12', 'APOGEE_TARGET2', 12]

APOGEE_TARGET2_bit_12

APOGEE_TARGET2_bit_12 - APOGEE_BALGE_SUPER_GIANT

Probable supergiant star in Galactic bulge

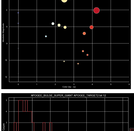
Fields: ['2M00:00' '012:00' '0'10:00' '0'10:00' '0'10:00' '010:00' 'GALCON']

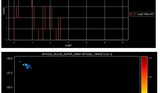
Stars: 93

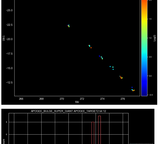
mean_separation: 0
mean_weight: 0
subgiants: 0
giants: 0
red_clump_giants: 0
rc_giants_fraction: 0
red_giants_fraction: 1

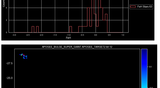
Dec: 0
Dec: 0
Dec: 0
Dec: 0
Dec: 0

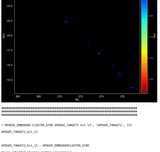
N_sum Dec: 23.70











==========

['APOGEE_DRWARDSS_CLUSTER_STAR-APOGEE_TARGET2 bit 13', 'APOGEE_TARGET2', 13]

APOGEE_TARGET2_bit_13

APOGEE_TARGET2_bit_13 - APOGEE_DRWARDSS_CLUSTER_STAR

Young embedded cluster member (ancillary)

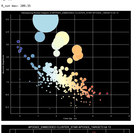
Fields: ['2M'00:00:00' '0'10:00' '0'10:' '0'10:00' '0'10:00:0.0' '0'10:00:0.1' '0'10:00:0.2' '0'10:00:0.3' '0'10:00' '0'10:00' '0'10:00' '0'10:00' '0'10:00']

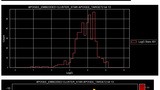
Stars: 401

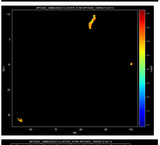
mean_separation: 145
mean_weight: 0
subgiants: 100
giants: 300
red_clump_giants: 0
rc_giants_fraction: 0
red_giants_fraction: 12

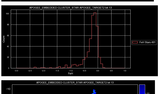
Dec: 11
Dec: 11
Dec: 11
Dec: 11
Dec: 11

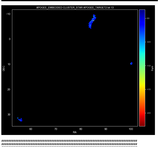
N_sum Dec: 200.25











==========

['APOGEE_LMBUDAR-APOGEE_TARGET2 bit 14', 'APOGEE_TARGET2', 14]

APOGEE_TARGET2_bit_14

APOGEE_TARGET2_bit_14 - APOGEE_LMBUDAR

Probable RC star in long bar (ancillary)

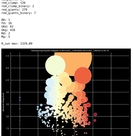
Fields: ['2M00:00' '00N:02' '00N:02' '0'4:00' '0'10:00' '0'0:02' '0'0:00' '0'2:00' '0'2:00' '0'2:00' '0'2:00' '0'2:00']

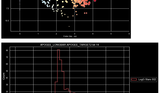
Stars: 582

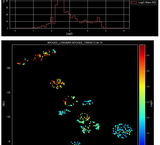
mean_separation: 31
mean_weight: 0
subgiants: 16
giants: 566
red_clump_giants: 2
rc_giants_fraction: 0
red_giants_fraction: 7

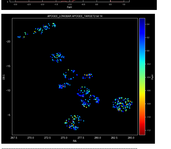
Dec: 0
Dec: 0
Dec: 0
Dec: 0
Dec: 0

N_sum Dec: 1135.89

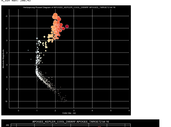


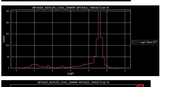


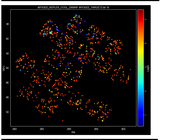


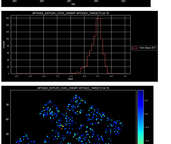


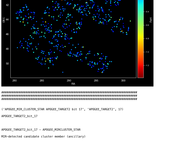

```
APOGEE_PREDEFINED APOGEE_TARGET1 bit 17, 'APOGEE_TARGET1', 131

APOGEE_TARGET1_bit_15

APOGEE_TARGET1_bit_15 = APOGEE_DRESSLER_STAR

Dressler-Star star (earlier)

Fields: 2'B9=BHB' '2DS-BHB'

Stars: 2

main_sequences: 2
subgiants: 0
giants: 0
red_clump_stars: 0
red_giants_stars: 0
red_giants_binary: 0

Mg: 0
Al: 0
Si: 0
Ca: 0
Mn: 0
Ni: 0

********************************************************************

1'APOGEE_ASPCAP_COOL_DWARF APOGEE_TARGET2 bit 10', 'APOGEE_TARGET2', 162

APOGEE_TARGET2_bit_10

APOGEE_TARGET2_bit_10 = APOGEE_ASPCAP_COOLDWARF

Aspcap cool dwarf or subgiant (earlier)

Fields: 1'G40-BDS:G1' 'G40_BDS:G2' 'G40_BDS:G3' 'G40_BDS:G4' 'G40_BDS:G5' 'G40_BDS:G6'
'G40_BDS:G7' 'G40_BDS:G8' 'G40_BDS:G9' 'K1J_BDS:K1' 'K1J_BDS:K2'
'K1J_BDS:K3' 'K1J_BDS:K4' 'K1J_BDS:K5' 'K1J_BDS:K6' 'K1J_BDS:K7'
'K1J_BDS:K8' 'K1J_BDS:K9' 'K1J_BDS:K10'

Stars: 877

main_sequences: 6448
subgiants: 0
giants: 0
red_clump_stars: 0
red_giants_stars: 0
red_giants_binary: 0

Mg: 0
Al: 0
Si: 0
Ca: 0
Mn: 0
Ni: 0

m_ext_max: 200.45
```



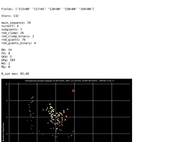


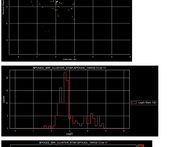


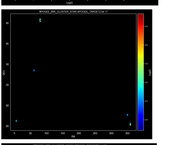




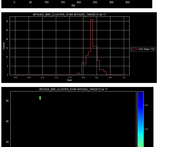

```
********************************************************************

1'APOGEE_RCM_CLUSTER_STAR APOGEE_TARGET2 bit 17', 'APOGEE_TARGET2', 171

APOGEE_TARGET2_bit_17

APOGEE_TARGET2_bit_17 = APOGEE_RCMCLUSTER_STAR

RCM-detected candidate cluster member (earlier)

Fields: 2'C19:DWF' 'C19:WD' 'C19:WDF' 'C19:WDF' 'C19:WDF'

Stars: 132

main_sequences: 131
subgiants: 0
giants: 0
red_clump: 0
red_giants_stars: 0
red_giants_binary: 0

Mg: 0
Al: 0
Si: 0
Ca: 0
Mn: 0
Ni: 0

m_ext_max: 93.65
```

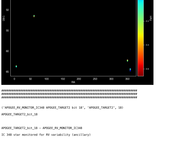


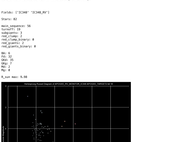


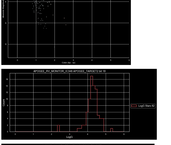


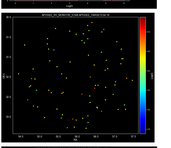

```
********************************************************************

1'APOGEE_MS_MONITOR_STAR APOGEE_TARGET2 bit 18', 'APOGEE_TARGET2', 181

APOGEE_TARGET2_bit_18

APOGEE_TARGET2_bit_18 = APOGEE_MS_MONITOR_STAR

2C 1AB star monitored for RV variability (earlier)

Fields: 2'2C1AB' '2C1AB_RV'

Stars: 92

main_sequences: 91
subgiants: 0
giants: 0
red_clump: 0
red_giants_stars: 0
red_giants_binary: 0

Mg: 0
Al: 0
Si: 0
Ca: 0
Mn: 0
Ni: 0

m_ext_max: 5.92
```



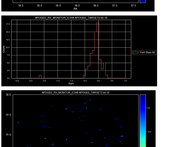


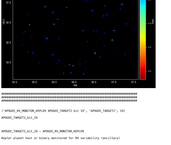


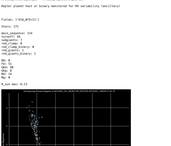


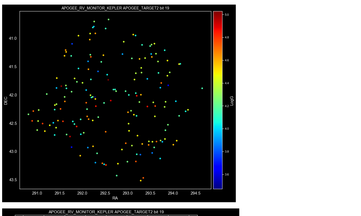


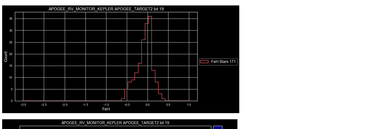

```
********************************************************************

1'APOGEE_RV_MONITOR_ASPCAP APOGEE_TARGET2 bit 19', 'APOGEE_TARGET2', 191

APOGEE_TARGET2_bit_19

APOGEE_TARGET2_bit_19 = APOGEE_RV_MONITOR_ASPCAP

Aspcap giant host or binary monitored for RV variability (earlier)

Fields: 2'K1J_BDS:G1'

Stars: 171

main_sequences: 154
subgiants: 0
giants: 0
red_clump_stars: 0
red_giants_stars: 0
red_giants_binary: 1

Mg: 0
Al: 0
Si: 0
Ca: 0
Mn: 0
Ni: 0

m_ext_max: 6.13
```

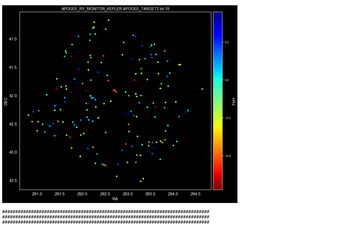













```
##############################################################################
##############################################################################
##############################################################################
```

```
('APOGEE_GES_CALIBRATE APOGEE_TARGET2 bit 20', 'APOGEE_TARGET2', 20)
```

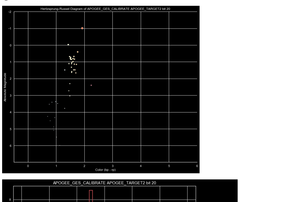
```
APOGEE_TARGET2_bit_20
```

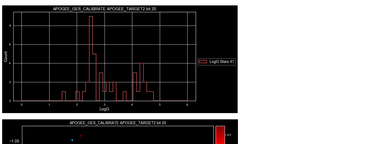
```
APOGEE_TARGET2_bit_20 = APOGEE_GES_CALIBRATE
```

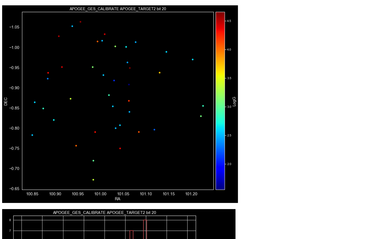
```
Gaia-ESO calibrator
```

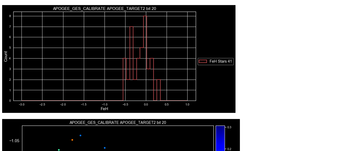
```
Fields: ['COROTA3']

Stars: 41

main_sequence: 9
turnoff: 1
subgiants: 1
red_lump: 0
red_lump_binary: 0
red_giants: 30
red_giants_binary: 0

BA: 0
FG: 5
GKd: 8
GKg: 28
MS: 9
MG: 0
```

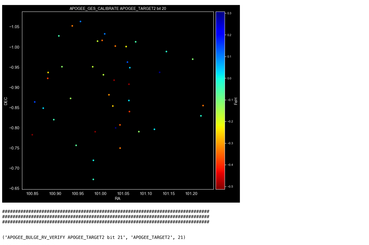
```
R_sun max: 47.26
```












```
##############################################################################
##############################################################################
##############################################################################
```

```
('APOGEE_BULGE_RV_VERIFY APOGEE_TARGET2 bit 21', 'APOGEE_TARGET2', 21)
```

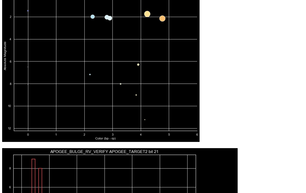
```
APOGEE_TARGET2_bit_21
```

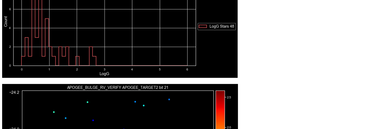
```
APOGEE_TARGET2_bit_21 = APOGEE_BULGE_RV_VERIFY
```

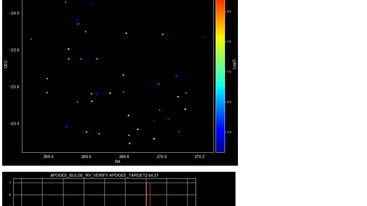
```
Bulge commissioning RV verification
```

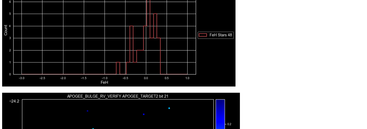
```
Fields: ['006+00']

Stars: 48

main_sequence: 0
turnoff: 0
subgiants: 0
red_lump: 1
red_lump_binary: 0
red_giants: 47
red_giants_binary: 1

BA: 0
FG: 0
GKd: 0
GKg: 0
MS: 0
MG: 42
```

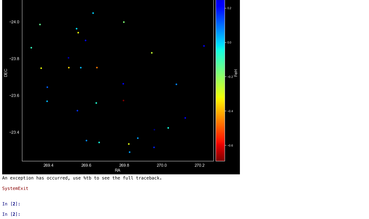
```
R_sun max: 49.64
```












```
An exception has occurred, use %tb to see the full traceback.

Spyder[edit]

In [2]:

In [2]:
```