

# **Be55, Ki02 ve NGC457 Açık Yıldız Kümelerine Ait Temel ve Yapısal Parametrelerin Belirlenmesi**

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# İçerik


- Küme seçimi ve verilerin elde edilmesi,
- Kümeye ait yıldızların belirlenmesi,
- Verilerin analizi,
- Sonuçlar ve tartışma

Seilen kmelerin;

- CCD UBV(RI)<sub>c</sub> fotometrik gzlemleri Sierra San Pedro Martir (SPM) 'deki 0.84 m'lik Ritchey-Chretien teleskobu ile yapılmıřtır.
- CCD UBV(RI)<sub>c</sub> verilerinin yanı sıra 2MASS (The Two Micron All Sky Survey) kataloėundaki JHKs fotometrik verileri de kullanılmıřtır.



- PPMXL ( A Proper Motion Catalog Combining USNO-B and 2MASS)

CDSPortal Simbad VizieR Aladin X-Match Other Help 

## Catalog Selection Page

[Fast Xmatch with large catalogs or Simbad](#)

**Search Criteria**

[Save in CDSPortal](#)

Keywords

+PPMXL

Tables

I/317

..sample

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**Preferences**

max: unlimited

ascii text/plain

All columns

**Compute**

Distance p

Position angle  $\theta$

Distance (x,y)

Galactic

J2000

B1950

Ecl. J2000

default

Sort by Distance

+ order -

No sort

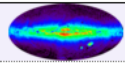
**Position in:**

Simbad

**Simple Target** [List Of Targets](#)

Target Name (resolved by [Sesame](#)) or Position:   J2000  arcmin

Target dimension:  Radius  Box size

Radius  IR  DM  X  Y  The PPMXL Catalog (Roeser+ 2010) [Similar Catalogs](#) [2010AJ...139.2440R](#) [ReadMe+ftp](#) 

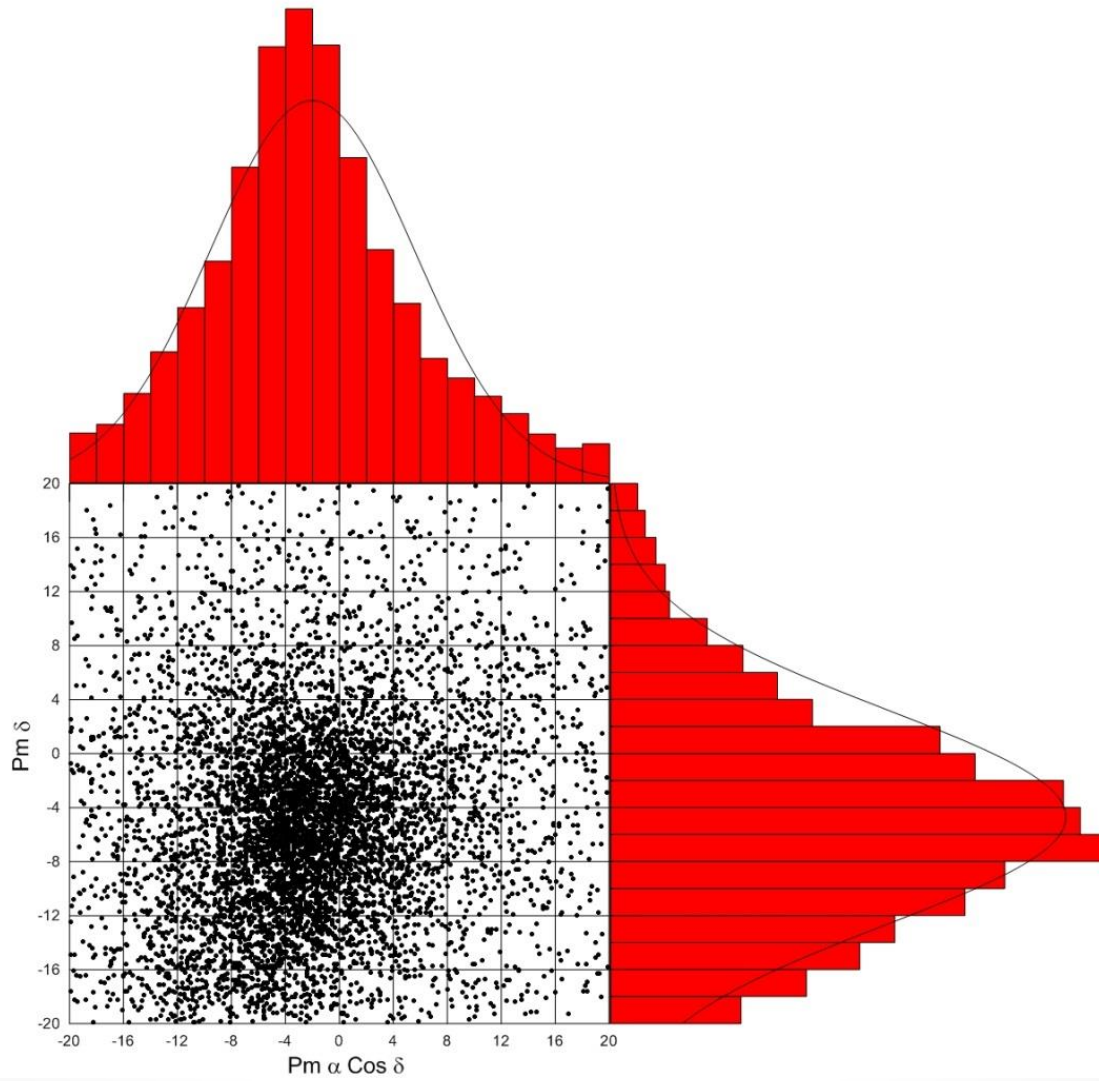
I/317 [Post annotation](#)

I.I/317/sample PPMXL catalog of positions and proper motions on the ICRS (910469430 rows)

**Simple Constraint** [List Of Constraints](#)

Query by [Constraints](#) applied on Columns (Output Order:  +  -)

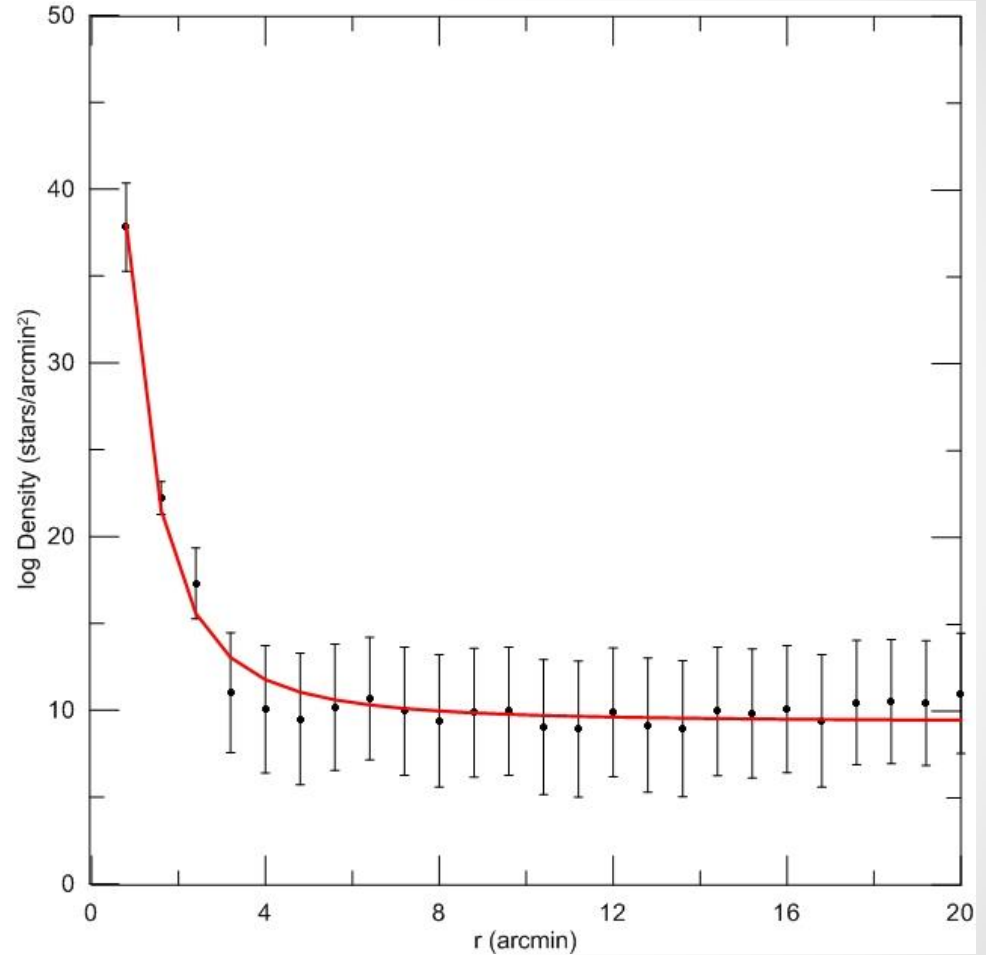
| Show                                | Sort                  | Column    | Clear                | Constraint | Explain (UCD)   |
|-------------------------------------|-----------------------|-----------|----------------------|------------|---|
| <input checked="" type="checkbox"/> | <input type="radio"/> | PPMXL     | <input type="text"/> | (char)     | Identifier ( <a href="#">Note 5</a> ) ( <a href="#">meta.id:meta.main</a> )                                   |
| <input checked="" type="checkbox"/> | <input type="radio"/> | RAJ2000   | <input type="text"/> | deg        | Right Ascension J2000.0, epoch 2000.0 ( <a href="#">pos.eq.ra:meta.main</a> )                                 |
| <input checked="" type="checkbox"/> | <input type="radio"/> | DEJ2000   | <input type="text"/> | deg        | Declination J2000.0, epoch 2000.0 ( <a href="#">pos.eq.dec:meta.main</a> )                                    |
| <input checked="" type="checkbox"/> | <input type="radio"/> | pmRA      | <input type="text"/> | mas/yr     | Proper Motion in RA*cos(DEdeg) ( <a href="#">pos.pm:pos.eq.ra</a> )   |
| <input checked="" type="checkbox"/> | <input type="radio"/> | pmDE      | <input type="text"/> | mas/yr     | Proper Motion in Dec ( <a href="#">pos.pm:pos.eq.dec</a> )  |
| <input checked="" type="checkbox"/> | <input type="radio"/> | epRA      | <input type="text"/> | yr         | Mean Epoch (RA) ( <a href="#">time.epoch</a> )  |
| <input checked="" type="checkbox"/> | <input type="radio"/> | epDE      | <input type="text"/> | yr         | Mean Epoch (Dec) ( <a href="#">time.epoch</a> )   |
| <input checked="" type="checkbox"/> | <input type="radio"/> | e_RAJ2000 | <input type="text"/> | mas        | Mean error in RA*cos(DEdeg) at mean epoch ( <a href="#">Note 6</a> ) ( <a href="#">stat.error:pos.eq.ra</a> ) |
| <input checked="" type="checkbox"/> | <input type="radio"/> | e_DEJ2000 | <input type="text"/> | mas        | Mean error in Dec at mean epoch ( <a href="#">Note 6</a> ) ( <a href="#">stat.error:pos.eq.dec</a> )          |
| <input checked="" type="checkbox"/> | <input type="radio"/> | e_pmRA    | <input type="text"/> | mas/yr     | Mean error in pmRA*cos(DEdeg) ( <a href="#">stat.error:pos.pm:pos.eq.ra</a> )                                 |
| <input checked="" type="checkbox"/> | <input type="radio"/> | e_pmDE    | <input type="text"/> | mas/yr     | Mean error in pmDec ( <a href="#">stat.error:pos.pm:pos.eq.dec</a> )  |



Be55 Kümesinin öz hareket dağılımı.

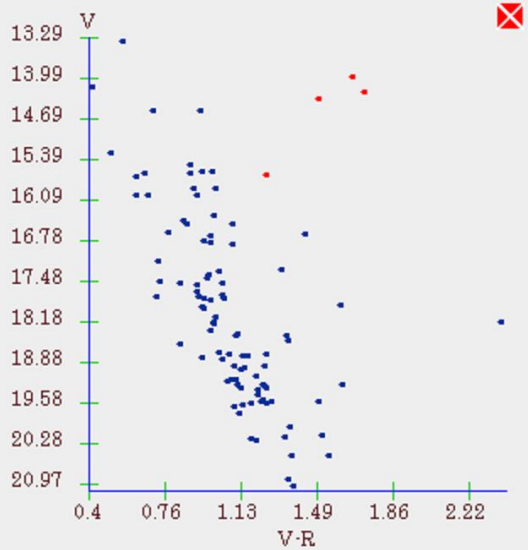
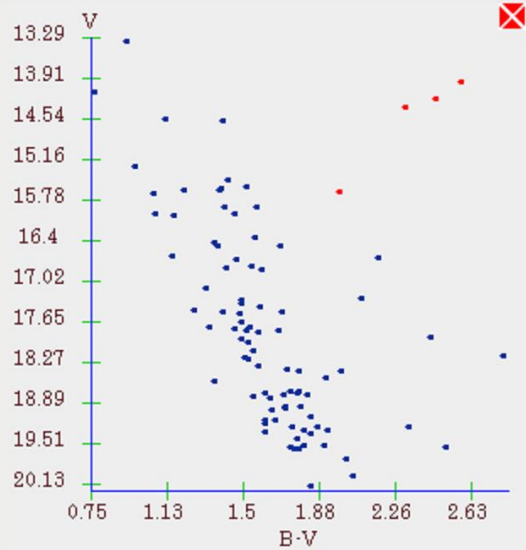
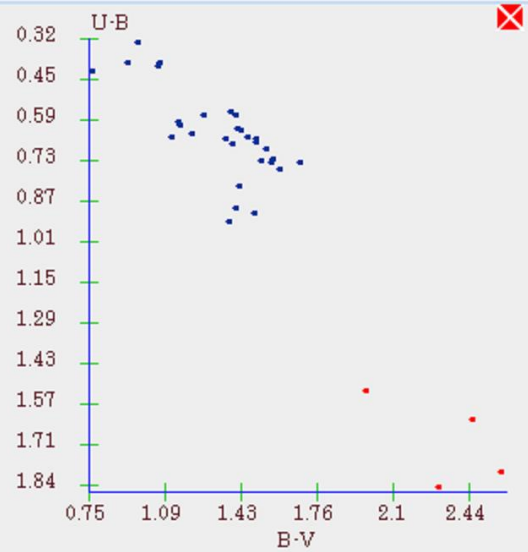
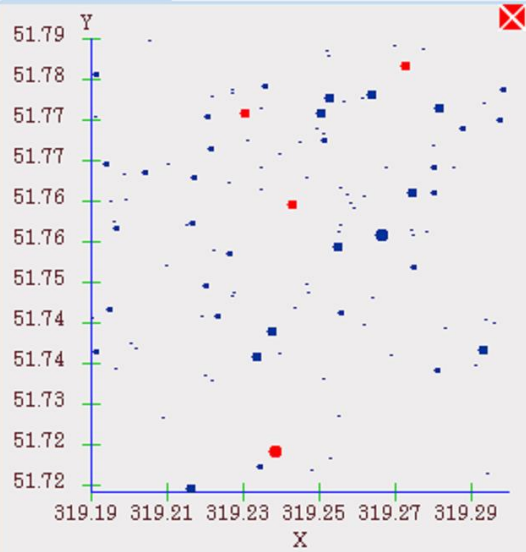
## Radyal Yoğunluk Profili

- Be55,  
     $R_c=0.8\pm 0.1$   
     $R_{lim}=5$
- Ki02,  
     $R_c=1.2\pm 0.09$   
     $R_{lim}=5.5$
- NGC457,  
     $R_c=2.05\pm 0.3$   
     $R_{lim}=4$



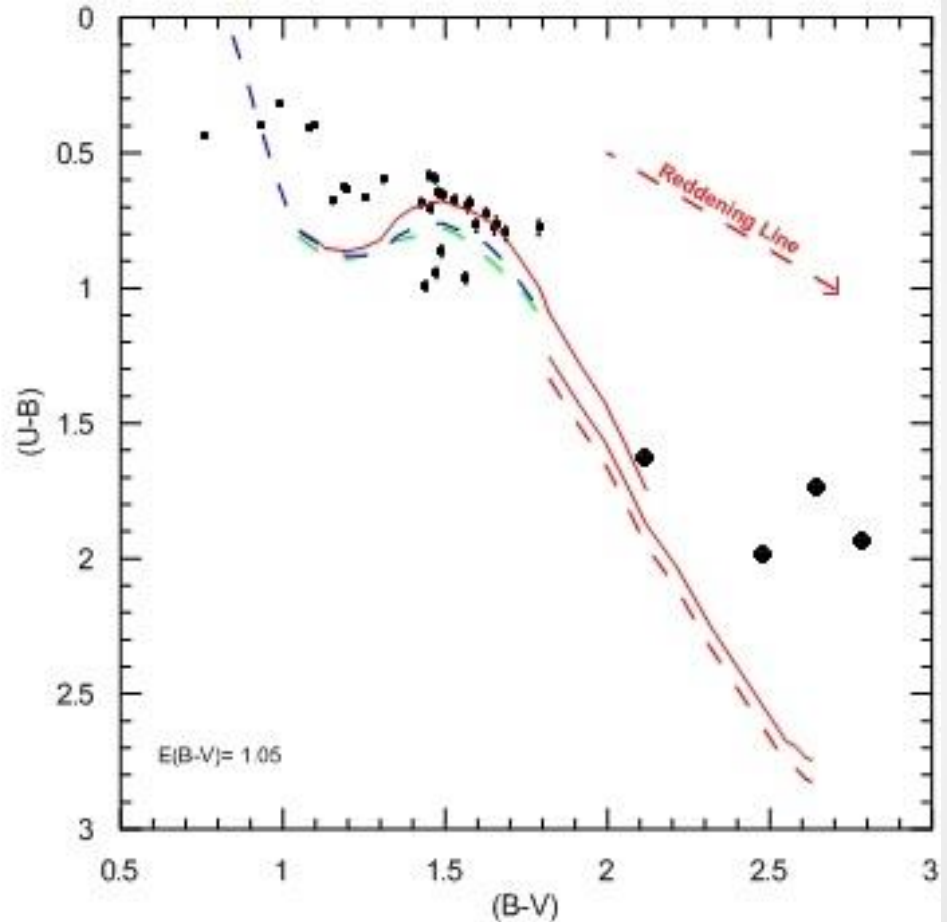
Be55 kümesinin radyal yoğunluk profili.

Cumulo: null-0



## Renk artığı, Metal ve Ağır element bolluğunun Belirlenmesi

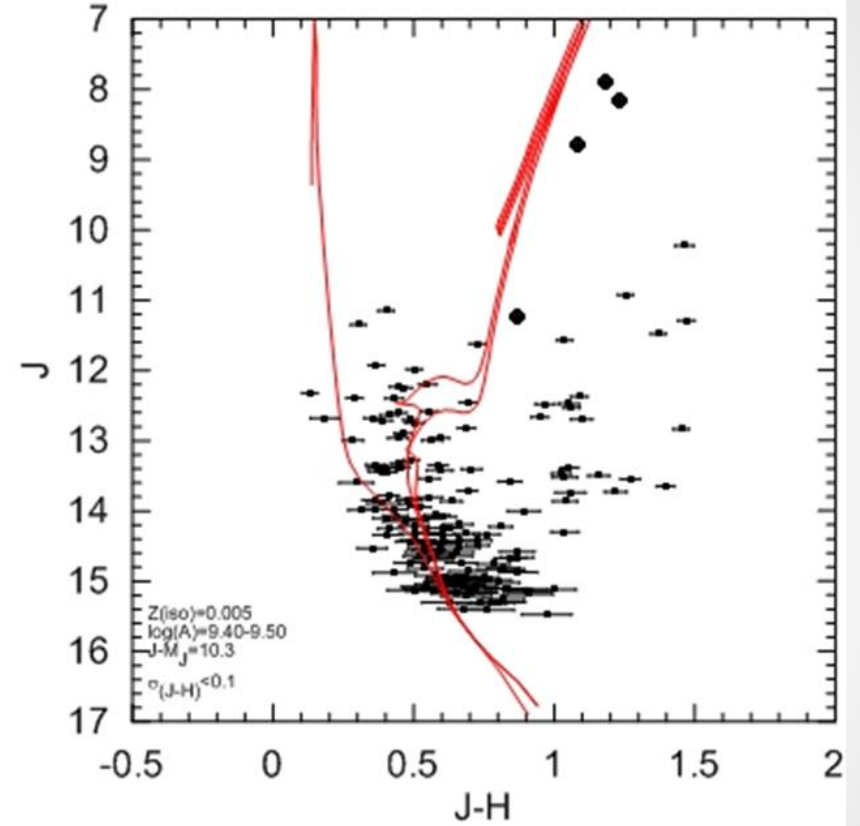
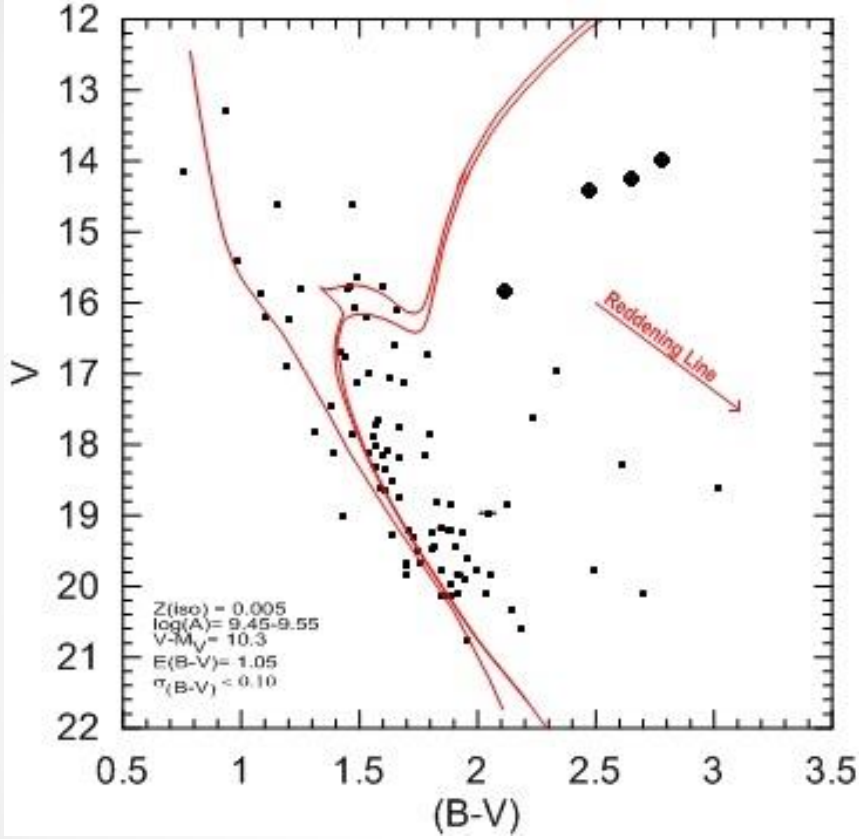
- $E(B-V)$ , SK82(Schmidt-Kaler,1982) anakolunun (U-B)-(B-V) renk-renk diyagramında küme üyelerinin fotometrik verilerine uygun bir fit elde edinceye kadar kızarma doğrultusu boyunca kaydırılmasından bulunmuştur.
- Metal bolluğu tayini  $\delta(U-B)$  morötesi artığı yöntemine göre yapılmıştır.



Be55 kümesinin renk-renk diyagramı.

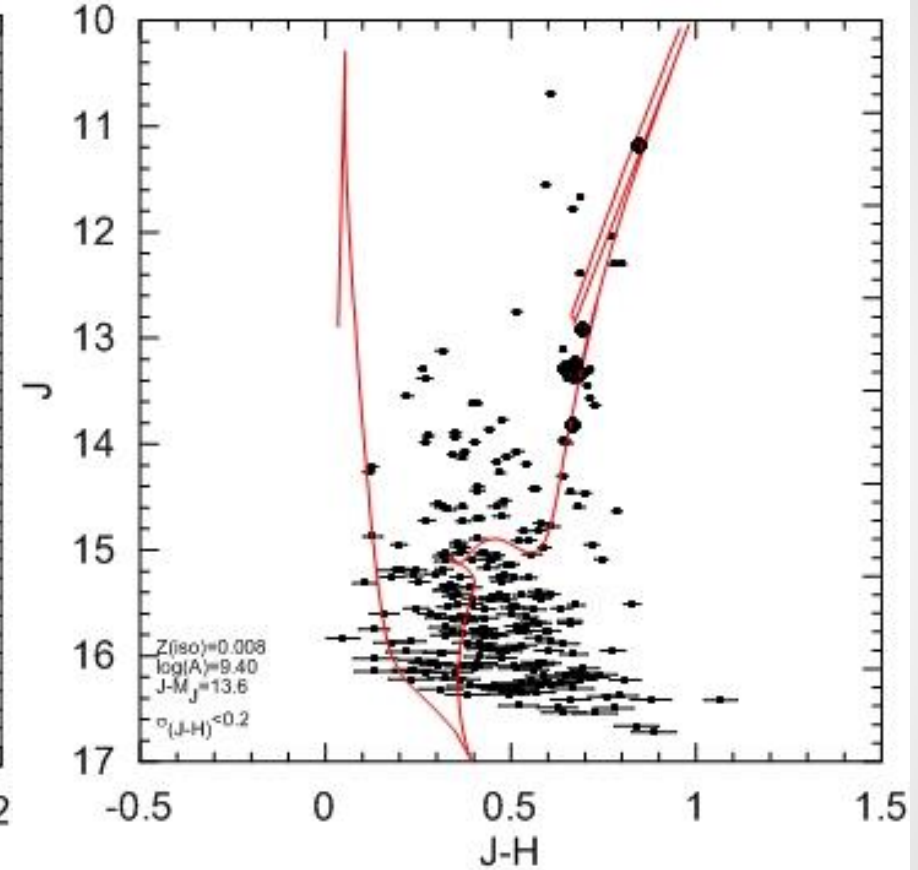
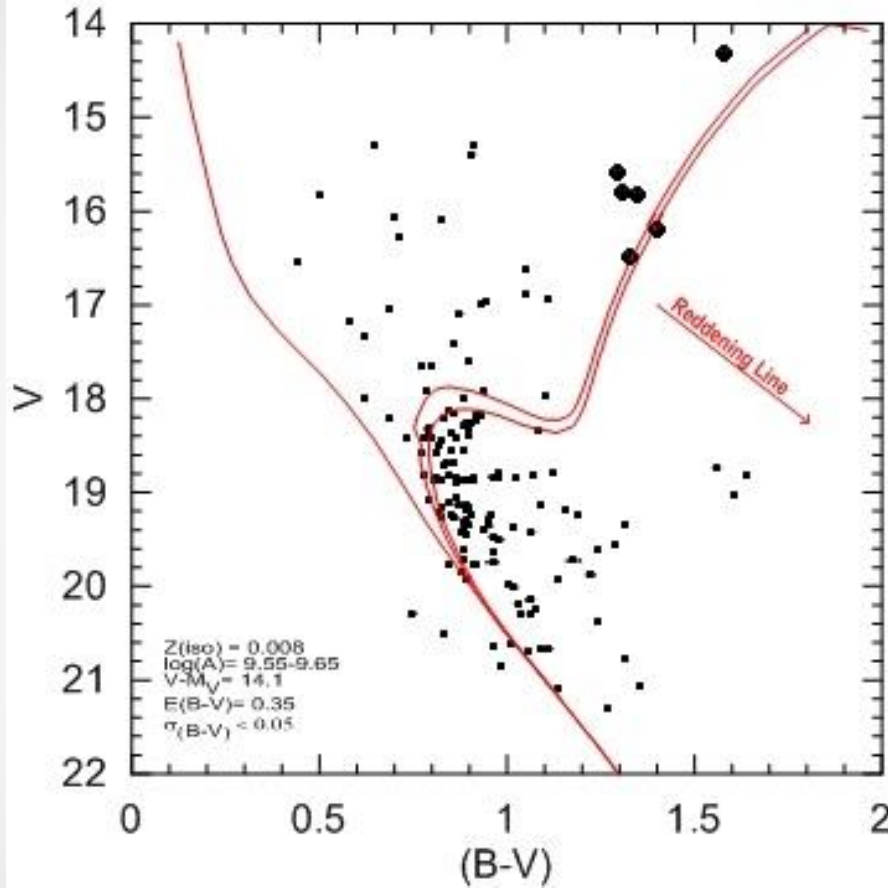


## Uzaklık Modülü ve Yaş Tayini



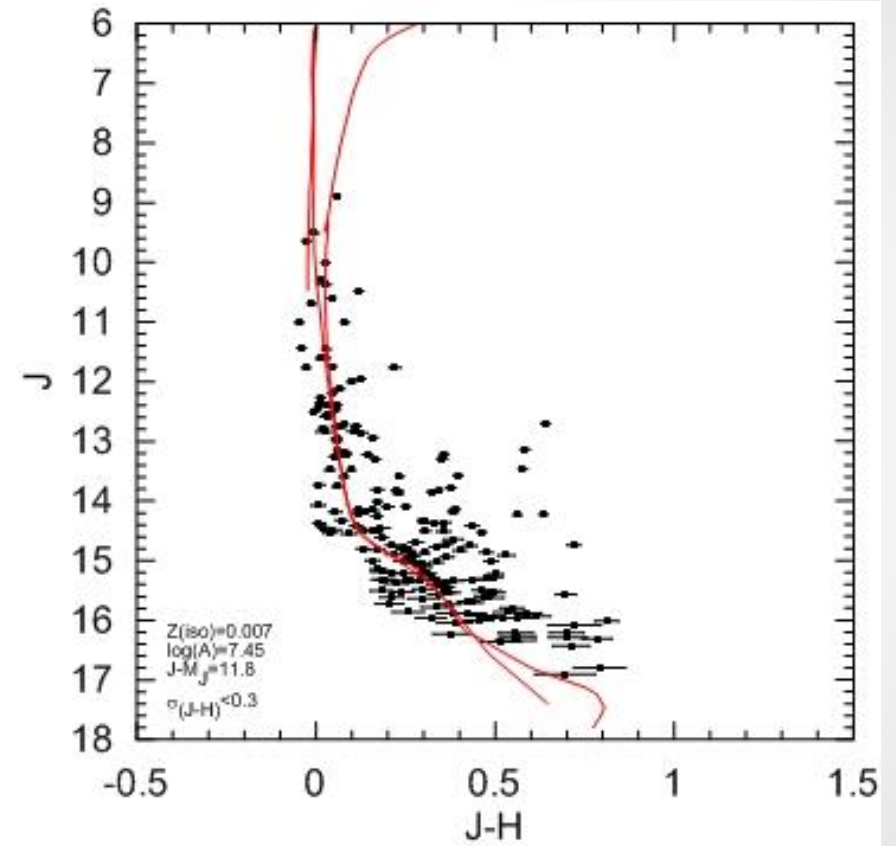
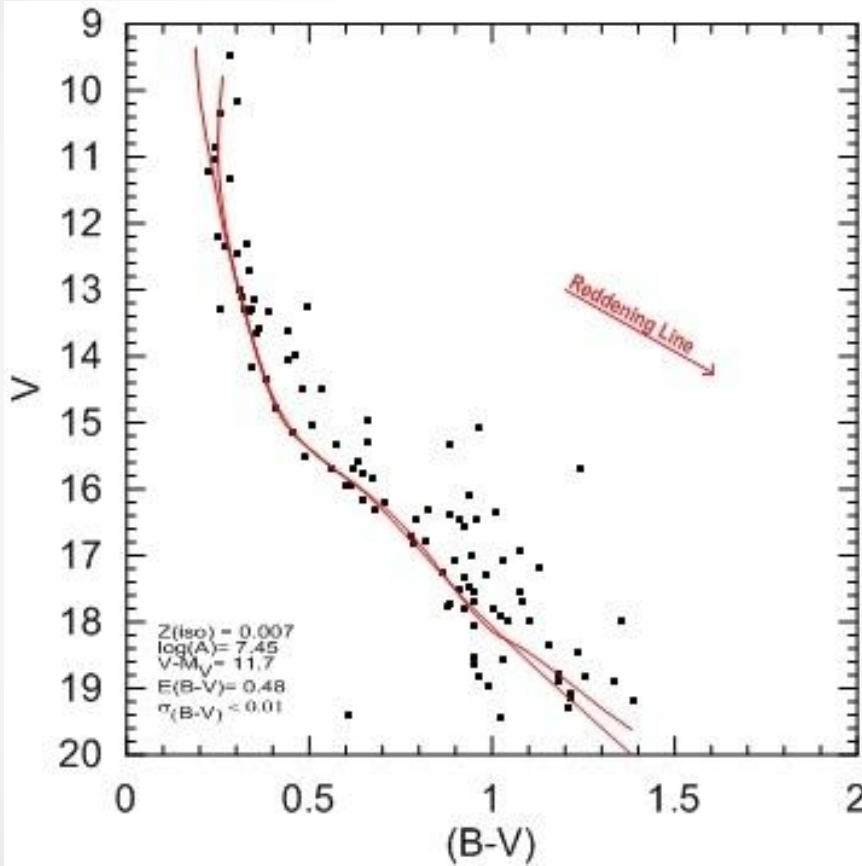
Be55 kümesinin renk-kadir diyagramlarına ait iki örnek.

## Uzaklık Modülü ve Yaş Tayini



Ki02 kümesinin renk-kadir diyagramlarına ait iki örnek.

## Uzaklık Modülü ve Yaş Tayini



NGC457 kümesinin renk-kadir diyagramlarına ait iki örnek.

## SONUÇ: Be55

| <b><math>E(B-V)=1.05\pm0.25</math></b> |                                  | <b><math>[Fe/H]= -0.56\pm0.13</math></b> |                  | <b><math>Z= 0.005\pm0.002</math></b> |                                 |
|--|----------------------------------|--|------------------|--------------------------------------|---------------------------------|
| <b>Renk</b>                            | <b><math>(V-M_V)_0</math></b>    | <b>d [kpc]</b>                           | <b>Log(A)</b>    | <b>Log(A)<sub>fit</sub></b>          | <b>A<sub>fit</sub> [Gyıl]</b>   |
| <b>(B-V)</b>                           | <b><math>10.30\pm0.25</math></b> | <b><math>1.11\pm0.13</math></b>          | <b>9.45-9.55</b> | <b><math>9.55\pm0.10</math></b>      | <b><math>3.55\pm0.92</math></b> |
| <b>(R-I)</b>                           | <b><math>10.30\pm0.10</math></b> | <b><math>1.11\pm0.53</math></b>          | <b>9.45-9.55</b> | <b><math>9.55\pm0.05</math></b>      | <b><math>3.55\pm0.43</math></b> |
| <b>(V-I)</b>                           | <b><math>10.30\pm0.05</math></b> | <b><math>1.11\pm0.26</math></b>          | <b>9.45-9.55</b> | <b><math>9.55\pm0.05</math></b>      | <b><math>3.55\pm0.43</math></b> |
| <b>(J-H)</b>                           | <b><math>10.30\pm0.10</math></b> | <b><math>1.11\pm0.53</math></b>          | <b>9.40-9.50</b> | <b><math>9.50\pm0.10</math></b>      | <b><math>3.16\pm0.82</math></b> |
| <b>(J-K)</b>                           | <b><math>10.50\pm0.10</math></b> | <b><math>1.25\pm0.58</math></b>          | <b>9.40-9.50</b> | <b><math>9.50\pm0.10</math></b>      | <b><math>3.16\pm0.82</math></b> |

## SONUÇ: Ki02

**$E(B-V)=0.35\pm0.15$**

**$[Fe/H]=-0.36\pm0.12$**

**$Z=0.008\pm0.002$**

| <b>Renk</b>  | <b><math>(V-M_V)_0</math></b> | <b>d [kpc]</b>   | <b>Log(A)</b>    | <b>Log(A)<sub>fit</sub></b> | <b>A<sub>fit</sub> [Gyll]</b> |
|--------------|-------------------------------|------------------|------------------|-----------------------------|-------------------------------|
| <b>(B-V)</b> | <b>14.10±0.08</b>             | <b>6.60±0.25</b> | <b>9.55-9.65</b> | <b>9.65±0.05</b>            | <b>4.47±0.55</b>              |
| <b>(R-I)</b> | <b>14.00±0.10</b>             | <b>6.02±0.28</b> | <b>9.60-9.70</b> | <b>9.70±0.05</b>            | <b>5.01±0.61</b>              |
| <b>(V-I)</b> | <b>14.10±0.10</b>             | <b>6.60±0.30</b> | <b>9.55-9.65</b> | <b>9.65±0.05</b>            | <b>4.47±0.55</b>              |
| <b>(J-H)</b> | <b>13.60±0.10</b>             | <b>5.24±0.24</b> | <b>9.40</b>      | <b>9.40±0.05</b>            | <b>2.51±0.31</b>              |
| <b>(J-K)</b> | <b>13.60±0.10</b>             | <b>5.24±0.24</b> | <b>9.40</b>      | <b>9.40±0.05</b>            | <b>2.51±0.31</b>              |

## SONUÇ: NGC457

$$E(B-V)=0.48\pm0.21$$

$$[Fe/H]=-0.39\pm0.46$$

$$Z=0.007\pm0.007$$

| Renk  | $(V-M_V)_0$ | d [kpc]   | Log(A) | Log(A) <sub>fit</sub> | A <sub>fit</sub> [Gyl] |
|-------|-------------|-----------|--------|-----------------------|------------------------|
| (B-V) | 11.70±0.23  | 2.18±0.22 | 7.45   | 7.45±0.10             | 0.03±0.01              |
| (R-I) | 11.80±0.10  | 2.29±0.10 | 7.45   | 7.45±0.15             | 0.03±0.01              |
| (V-I) | 11.70±0.10  | 2.18±0.22 | 7.45   | 7.45±0.10             | 0.03±0.01              |
| (J-H) | 11.80±0.10  | 2.18±0.10 | 7.45   | 7.45±0.15             | 0.03±0.01              |
| (J-K) | 11.70±0.10  | 2.18±0.10 | 7.45   | 7.45±0.15             | 0.03±0.01              |

- Açık yıldız kümelerinin özellikle yaş ve metal bolluğu gibi parametrelerinin belirlenmesi, Galaksi'nin evrim sürecinin anlaşılmasında önemli rol oynayacaktır.

# TEŞEKKÜRLER

- Bu çalışma 114F123 no'lu proje ile desteklenmiştir.