Catálogo GAIA de Estrelas até 23 parsecs do Sol

Metas do Trabalho

- Combinar dados de dois catálogos: Gaia e Hipparcos
- Calcular magnitudes e índices de cor de todas as Estrelas
- Gerar diagramas HR das Estrelas (magnitude vs temperatura)

Satélite Hipparcos

- Satélite lançado pela Agência Espacial Europeia em 18 de agosto de 1989

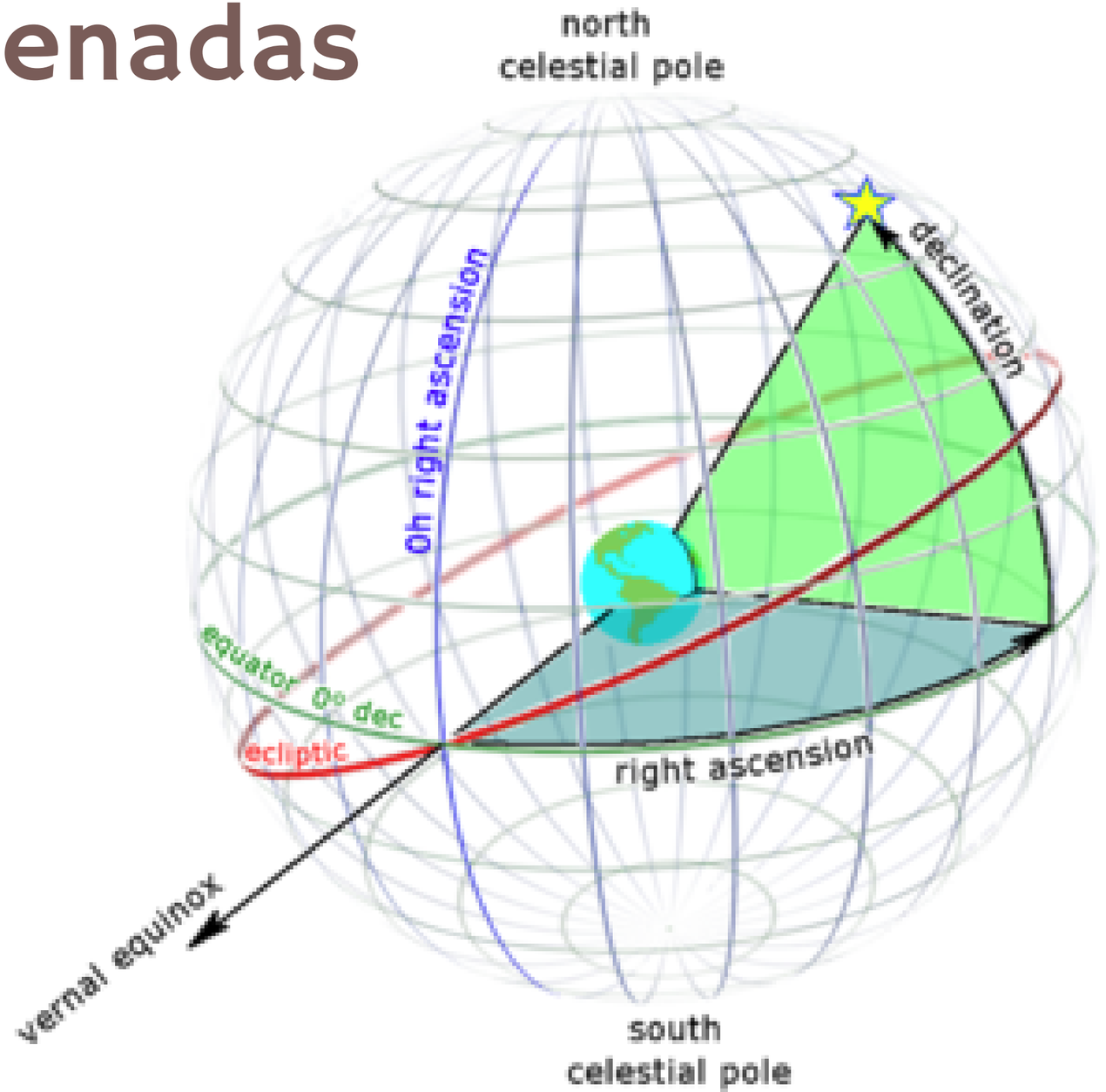
Missão Gaia

- Telescópio espacial da Agência Espacial Europeia (ESA)
- Lançado em 19 de Dezembro de 2013

Tratamento do DataSet

Conversão de Coordenadas

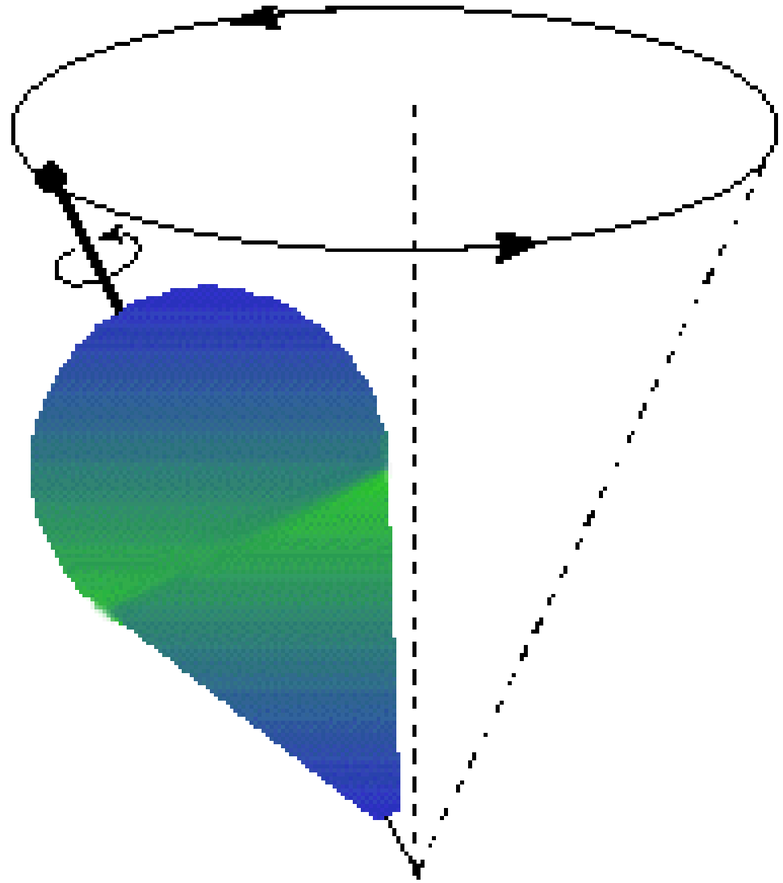
- Ascensão Reta e Declinação
- Época Hipparcos: 2000.0
- Época Gaia: 2016.0



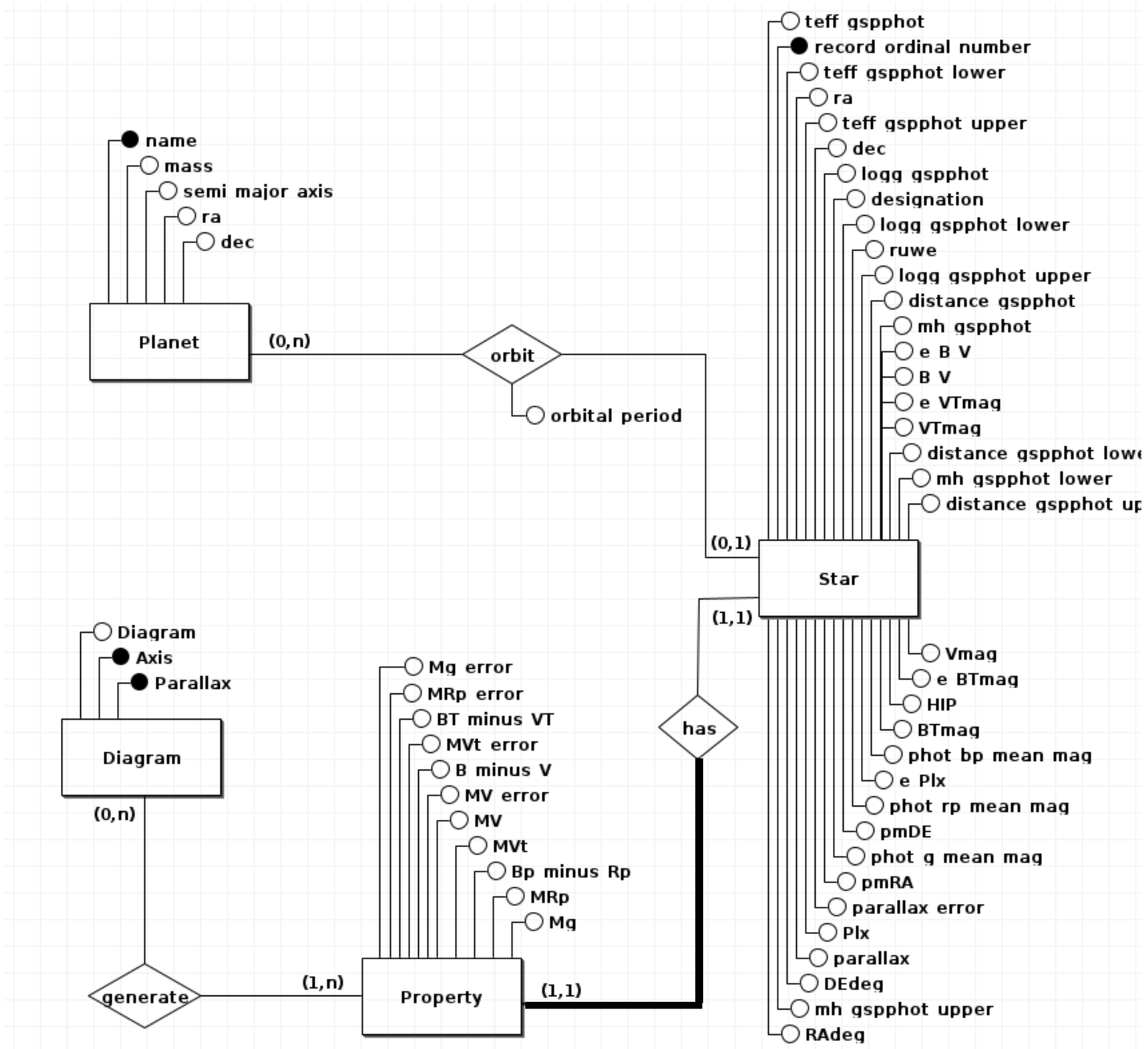
Tratamento do DataSet

Movimento Próprio e Precessão

- **Movimento próprio das Estrelas (pmRA e pmDE)**
- **Movimento de precessão do eixo da Terra (26 mil anos)**



Modelo Conceitual


name
mass
semi major axis
ra
dec
Planet
(0,n)
orbit
orbital period
(0,1)
Star
(1,1)
has
teff gspphot
record ordinal number
teff gspphot lower
ra
teff gspphot upper
dec
logg gspphot
designation
logg gspphot lower
ruwe
logg gspphot upper
distance gspphot
mh gspphot
e B V
B V
e VTmag
VTmag
distance gspphot lowe
mh gspphot lower
distance gspphot up
Vmag
e BTmag
HIP
BTmag
phot bp mean mag
e Plx
phot rp mean mag
pmDE
phot g mean mag
pmRA
parallax error
Plx
parallax
DEdeg
mh gspphot upper
RAdeg
Diagram
Axis
Parallax
Diagram
(0,n)
generate
(1,n)
Mg error
MRp error
BT minus VT
MVt error
B minus V
MV error
MV
MVt
Bp minus Rp
MRp
Mg
Property
(1,1)

Modelo Lógico

Star (record_ordinal_number, ra , dec, designation, ruwe, distance_gspphot, distance_gspphot_lower, distance_gspphot_upper, teff_gspphot, teff_gspphot_lower, teff_gspphot_upper, logg_gspphot, logg_gspphot_lower, logg_gspphot_upper, mh_gsppho mh_gspphot_lower, mh_gspphot_upper, parallax, parallax_error, phot_g_mean_mag, phot_rp_mean_mag, phot_bp_mean_mag, HIP, Vmag, RAdeg, DEdeg, Plx, pmRA, pmDE, e_Plx, BTmag, e_BTmag, VTmag, e_VTmag, B_V, e_B_V)
PK(record_ordinal_number)

Property (record_ordinal_number, BT_minus_VT, B_minus_V, MV, MVt, Bp_minus_Rp, MRp, Mg, Mg_error, MRp_error, MVt_error, MV_error)
PK(record_ordinal_number)
FK(record_ordinal_number) references Star(record_ordinal_number)

Diagram(diagram, axis, parallax)
PK(parallax, axis)

Planet(name, mass, semi_major_axis, ra, dec, orbital_period)
PK(name)

Generate(record_ordinal_number, parallax, axis)
PK(record_ordinal_number, parallax, axis)
FK(record_ordinal_number) references Property(record_ordinal_number)
FK(parallax, axis) references Diagram(parallax, axis)

Modelo Físico

```
create table Star (
    record_ordinal_number int not null
            auto_increment primary key,
    designation char(100),
    ra NUMERIC(65,30) not null,
    declination NUMERIC(65,30) not null,
    parallax NUMERIC(65,30) not null,
    parallax_error NUMERIC(65,30) not null,
    pmra NUMERIC(65,30) not null,
    pmdec NUMERIC(65,30) not null,
    ruwe NUMERIC(65,30) not null,
    phot_g_mean_mag NUMERIC(65,30) not null,
    phot_bp_mean_mag NUMERIC(65,30) not null,
    phot_rp_mean_mag NUMERIC(65,30) not null,
    teff_gspphot NUMERIC(65,30) not null,
    teff_gspphot_lower NUMERIC(65,30) not null,
    teff_gspphot_upper NUMERIC(65,30) not null,
    logg_gspphot NUMERIC(65,30) not null,
    logg_gspphot_lower NUMERIC(65,30) not null,
    logg_gspphot_upper NUMERIC(65,30) not null ,
    mh_gspphot NUMERIC(65,30) not null,
    mh_gspphot_lower NUMERIC(65,30) not null,
    mh_gspphot_upper NUMERIC(65,30) not null,
    distance_gspphot NUMERIC(65,30) not null,
    distance_gspphot_lower NUMERIC(65,30) not null,
    distance_gspphot_upper NUMERIC(65,30) not null,
    HIP long not null,
    Vmag NUMERIC(65,30),
    RAdeg NUMERIC(65,30),
    Vmag_2016 NUMERIC(65,30),
    RAdeg_2016 NUMERIC(65,30),
    DEdeg NUMERIC(65,30),
    Plx NUMERIC(65,30),
    BTmag NUMERIC(65,30),
    VTmag NUMERIC(65,30),
    B_V NUMERIC(65,30)
);
```

```
create table Property (
  record_ordinal_number int not null
                    auto_increment primary key;
  Mg double not null,
  MRp double not null,
  Bp_minus_Rp double not null,
  MVt double not null,
  MV double not null,
  B_minusV double not null,
  BT_minus_VT double not null,
  Mg_error double not null,
  MRp_error double not null,
  MVt_error double not null,
  MV_error double not null,
  foreign key (record_ordinal_number)
references Star(record_ordinal_number) on
delete cascade
);
```

```
create table Diagram(
diagram blob not null,
axis char(10),
parallax double,
primary key (axis, parallax)
);
```

```
create table Generate(
   record_ordinal_number int not null
                        auto_increment;
   parallax double not null,
   axis char(10) not null,

   foreign key (record_ordinal_number)
references Star(record_ordinal_number) on
delete cascade,

   foreign key (axis, parallax) references
Diagram(axis, parallax) on delete cascade,

   primary key (record_ordinal_number,
parallax, axis)
);
```

```
create table Planet(
   name char(30),
   record_ordinal_number int null,
   mass double,
   semi_major_axis double,
   RAdeg double,
   DEdeg double,
   foreign key (record_ordinal_number)
references Star(record_ordinal_number),
   primary key(name)
);
```

Consultas SQL

Consultar a Estrela mais próxima do Sol (Proxima Centauri)

```
SELECT Source_Gaia.designation,
Source_Gaia.distance_gspphot
FROM Source_Gaia
ORDER BY distance_gspphot ASC
LIMIT 1;
```

Consultar a Estrela e suas propriedades principais (Hipparcos)

```
SELECT Source_Hipparcos.HIP, Source_Hipparcos.B_V,
Source_Hipparcos.BTmag - Source_Hipparcos.VTmag
FROM Source_Hipparcos;
```

Consultar características da gêmea solar 18 Scorpii (GAIA)

```
SELECT Source_Gaia.designation, Source_Gaia.distance_gspphot
FROM Source_Gaia
WHERE Source_Gaia.designation =  “Gaia DR3
4345775217221821312”;
```

Obrigada