Propagation of properties extracted from the HyperLEDA catalog in the calculation of luminosities of galaxies

Jose Enrique Ruiz

***Abstract*—**

and the calculation of the more complex properties:

- The distance in Mega parsecs (D) - The corrected apparent B magnitude (btc) - The optical luminosity in B-band (LB)

Specifically, this research object is focused on the calculation of the intrinsic luminosity in the Johnson B-band, in order to achieve it the measurement or calculation of all those astrophysical properties is needed. All the data involved in the characterization of the sample are stored in a local relational MySQL database. To maintain up to date this database and to register all the updates properly is part of this scientific experiment.*The scientific experiment represented by this research object pertains to the multi-wavelength study for a sample of the most isolated galaxies in the local universe. This study characterizes each galaxy of this sample through both the measurement of basic astrophysical properties: - The equatorial coordinates in J2000 epoch - The velocities in km/s (v) - The dust extinction coefficient (ag) - The axis ratio of the isophote 25 mag/arcsec2 (logr25) - The apparent total B magnitude (BT) - The morphological type (t)*

and the calculation of the more complex properties:

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Specifically, this research object is focused on the calculation of the intrinsic luminosity in the Johnson B-band, in order to achieve it the measurement or calculation of all those astrophysical properties is needed. All the data involved in the characterization of the sample are stored in a local relational MySQL database. To maintain up to date this database and to register all the updates properly is part of this scientific experiment.

I. Introduction

This document provides a paper-style view of the Research Object (RO) "*Propagation of properties extracted from the HyperLEDA catalog in the calculation of luminosities of galaxies*"[1] generated . The RO has been created, managed and preserved via ROHub platform [1]. Please refer to [2] for a general introduction to the RO concept, to [3] for a detailed description of the RO model, and to [4] for more information about ROHub platform.

The RO is of type *"Basic", which represents a general aggregation of related resources.* [2].

An overview of this RO is depicted in Figure 1. In summary, the methods used include *gathering_galaxy_properties_using_hyperleda_129473*[3], *calculation_of_distances__magnitutes_and_luminosities_using_hyperleda_220027*[4], *comparison_and_update_values_475535*[5], *propagation_of_physical_quantities_in_the_calculation_of_luminosities_of_galaxi* the results obtained include *velocity.sql*[7], *logr25.sql*[8], *lb.sql*[9], *session.vot*[10], *LB3d.txt*[11], *distances.sql*[12], *bt.sql*[13], *btc.sql*[14];Additionally, this RO has been enriched automatically with the following annotations:

- concepts (most frequently mentioned in the RO): *database, AMIGA, type, colors, CIG, Corrections, mag, sample, galaxies, sample, galaxies, luminosities*
- domains (fields of knowledge in which the main concepts are commonly used): *astronomy*
- frequent expressions (most frequently mentioned noun phrases): *Ro management tool session, galaxies page, preservation aspect, executive summary, luminosities of galaxies page, appendix C Ro management tool session, workflow building, Research Object structure*
- named entities (most frequently mentioned):
  - Places: *León, Alaska*

II. Resources

The resources encapsulated by the RO are summarized in table I

A. Key Resource details

- Name: *comparing.py*
  Description: *Not working properly with break lines in linux formatted files*

[1] *http://sandbox.rohub.org/rodl/ROs/Pack585/*

[2] See RO types definitions at http://w3id.org/ro/earth-science#

[3] http://sandbox.rohub.org/rodl/ROs/Pack585/gathering_galaxy_properties_using_hyperleda_129473

[4] http://sandbox.rohub.org/rodl/ROs/Pack585/calculation_of_distances__magnitutes_and_luminosities_using_hyperleda_220027

[5] http://sandbox.rohub.org/rodl/ROs/Pack585/comparison_and_update_values_475535

[6] http://sandbox.rohub.org/rodl/ROs/Pack585/propagation_of_physical_quantities_in_the_calculation_of_luminosities_of_galaxies_329415

[7] http://sandbox.rohub.org/rodl/ROs/Pack585/velocity.sql

[8] http://sandbox.rohub.org/rodl/ROs/Pack585/logr25.sql

[9] http://sandbox.rohub.org/rodl/ROs/Pack585/lb.sql

[10] http://sandbox.rohub.org/rodl/ROs/Pack585/session.vot

[11] http://sandbox.rohub.org/rodl/ROs/Pack585/LB3d.txt

[12] http://sandbox.rohub.org/rodl/ROs/Pack585/distances.sql

[13] http://sandbox.rohub.org/rodl/ROs/Pack585/bt.sql

[14] http://sandbox.rohub.org/rodl/ROs/Pack585/btc.sql

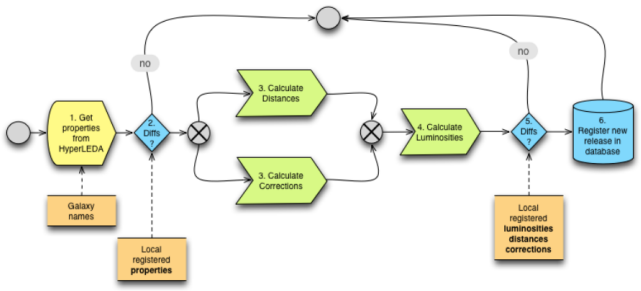


Fig. 1. Research Object Sketch

TABLE I
RESEARCH OBJECT RESOURCES

name	size	type
calculateDistance.py	1.5 KB	
velocity.sql	139.6 KB	Results, Result
local.txt	25.0 B	ExampleInputs, ExampleInput
logr25.sql	135.0 KB	Results, Result
gathering_galaxy_properties_using_hyperleda_129473	716.3 KB	Workflow, WorkflowDefinition
eq2gal.py	1.2 KB	
lb.sql	140.4 KB	Results, Result
NamesLEDA.txt	8.2 KB	ExampleInputs, ExampleInput
comparing.py	1.4 KB	
session.vot	2.8 MB	Results, Result
LB3d.txt	38.1 KB	Results, Result
extractPropertyVal.py	577.0 B	
D5.3v1_1.0.pdf	1.8 MB	Conclusions
calculation_of_distances__magnitutes_and_luminosities_using_hyperleda_220027	866.7 KB	Workflow, WorkflowDefinition
distances.sql	153.7 KB	Results, Result
comparison_and_update_values_475535	41.7 KB	Workflow, WorkflowDefinition
BTCorrectionCalc.py	2.4 KB	
aa18660-11.pdf	489.8 KB	Paper
propagation_of_physical_quantities_in_the_calculation_of_luminosities_of_galaxies_329415	207.4 KB	Workflow, WorkflowDefinition
bt.sql	129.1 KB	Results, Result
extractJ2000Coord.py	629.0 B	
luminositiesCalc.py	836.0 B	
morphoNew.txt	15.6 KB	ExampleInputs, ExampleInput
updating.py	1.6 KB	
coords2Deg.py	776.0 B	
btc.sql	141.9 KB	Results, Result
RECIPES.txt	9.6 KB	
remote.txt	25.0 B	ExampleInputs, ExampleInput
Schema.png	110.2 KB	Sketch

ACKNOWLEDGMENT

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REFERENCES

[1] The Research Object Management Platform - ROHub http://www.rohub.org/.

[2] K. Belhajjame, O. Corcho, D. Garijo, J. Zhao, P. Missier, D. Newman, R. Palma, S. Bechhofer, E. García Cuesta, J. M. Gómez-Pérez, S. Soiland-Reyes, L. Verdes-Montenegro, D. De Roure, and C. Goble "Workflow-Centric Research Objects: First Class Citizens in Scholarly Discourse", Proceedings of Workshop on the Semantic Publishing, SePublica Crete, Greece 28 May 2012.

[3] Belhajjame K., Zhao J., Garijo D., Gamble M., Hettne K., Palma R., Mina E., Corcho O., Gómez-Pérez J. M., Bechhofer S., Klyne G., Goble C. "Using a suite of ontologies for preserving workflow-centric research objects", Journal of Web Semantics: Science, Services and Agents on the World Wide Web Available online 11 February 2015 ISSN 1570-8268.

[4] Palma R., Corcho O., Gómez-Pérez J. M., Mazurek, C. "ROHub - A Digital Library of Research Objects Supporting Scientists Towards Reproducible Science". In Semantic Publishing Challenge of Proc. Extended Semantic Web Conference (ESWC) Crete, Greece 25-29 May 2014