

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

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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, *calcula-*

tion_of_distances_magnitudes_and_luminosities_using_hyperleda_220027, *comparison_and_update_values_475535*⁵, *propagation_of_physical_quantities_in_the_calculation_of_luminosities_of_galaxies_329415*⁶, *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*

⁴http://sandbox.rohub.org/rodl/ROs/Pack585/calculation_of_distances_magnitudes_and_luminosities_using_hyperleda_220027

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

⁶http://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>

¹<http://sandbox.rohub.org/rodl/ROs/Pack585/>

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

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

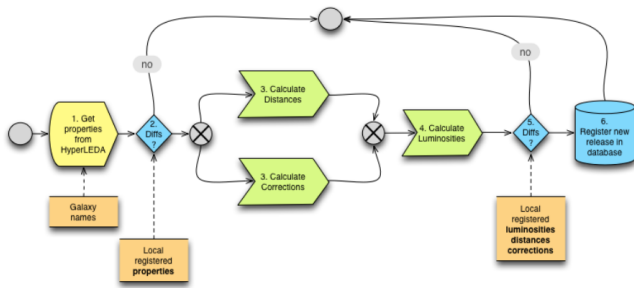


Fig. 1. Research Object Sketch

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__magnitudes_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