INES WWW SERVER

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1 Introduction

The INES WWW Server provides access to the at VILSPA post-NEWSIPS-processed IUE spectral data. It will be implemented at each individual National host. The actual functionality is much the same as for the current ESA IUE data server at `http://iuearc.vil spa.esa.es` (Yurrita & Barylak, 1996), except for the user registration, i.e.

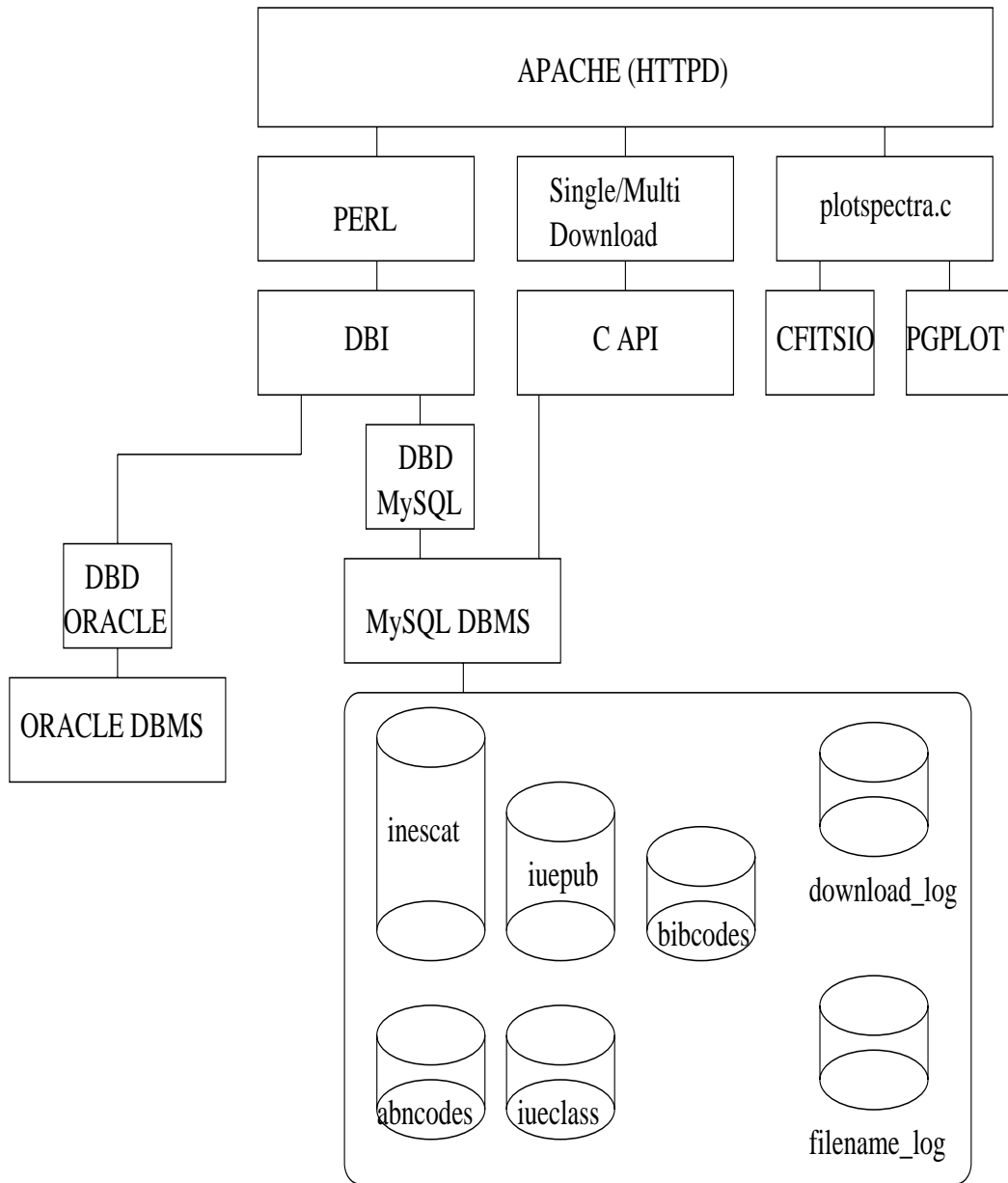- Support for queries to the INES catalog, IUE publications and BIBCODES fully integrated into the data download facility

- Data access (single download, FITS header and data preview) and distribution (multi-download with several compression schemes) of INES data comprising all low dispersion spectra and re-binned high resolution spectra; direct HTTP links to the line-by-line (SILO) spectra and the original high resolution spectra at the INES Principal Center are provided.

- Data access log maintenance (ie. download_log and filename_log) keeping (username, hostname, nr. files retrieved, nr. of bytes, type (ie. single, .tar, .tar.gz, .tar.Z or .zip), date/time, filename, etc.)

See Fig. 1 for a general overview of the INES WWW server.

2 Hardware

Other than for the Uniform Low Dispersion Archive and its Software Support Package (ULDA/USSP)(Wamsteker et al., 1989) which was available for both UNIX and VMS platforms, the INES server shall run only on UNIX based machines. With the advent of free PC based UNIX operating systems such as LINUX and FreeBSD, an inexpensive personal computer running LINUX is the suggested hardware environment. LINUX can provide the functionality of a UNIX workstation on PC hardware at a fraction of the cost. Hence the following hardware configuration is suggested:

Figure 1: **INES WWW Server**

APACHE (HTTPD)

PERL

Single/Multi
Download

plotspectra.c

DBI

C API

CFITSIO

PGPLOT

DBD
MySQL

DBD
ORACLE

MySQL DBMS

ORACLE DBMS

inescat

iuepub

bibcodes

download_log

abncodes

iueclass

filename_log

	Recommended	Minimum
CPU	INTEL Pentium PRO, 200 Mhz	INTEL 486, 100Mhz
RAM	32 to 64 Mbytes	16 Mbytes
Disk	3 to 4 Gbytes	2 Gbytes
Ethernet card	(LINUX compatible)	
CD ROM reader	(LINUX compatible)	

3 Software

Microsoft based operating systems (Windows and Windows NT) do not offer neither the power nor the stability of UNIX based system and are not as widely used for science applications in general and for astronomy specifically. Many of the astronomical image processing systems are available for LINUX ie. MIDAS, IRAF, STARLINK, etc. Hence the mayor software components for the INES WWW server are:

- LINUX operating system (our installations were tested on RedHat Linux 4.2 and 5.0) (see `http://www.redhat.com`)

- Apache, a public domain HTTP server for UNIX (version 1.2.4) (see `http://www.apache.org`)

- PERL, the Programmable Extraction and Reporting Language (at least version 5.004 together with the Data Base Interface (DBI - version 0.90) and Data Base Driver (DBD for MySQL) modules. Also the Common Gateway Interface (CGI) module is needed (version 2.36) (see `http://www.perl.org`, especially CPAN)

- MySQL a free (for most uses), fast and capable relational database management system (at least version 3.12.16) (see `http://www.tcx.se`)

- GNU C/C++ compiler (comes with LINUX)

- CFITSIO a machine-independent library of routines for reading and writing data in the FITS (Flexible Image Transport System) data format. Remember that all INES data are in FITS format. (see `http://heasarc.gsfc.nasa.gov/fitsio`).

- PGPLOT version 5.2.0, a graphic subroutine library needed for the INES online plotting package (see `ftp://astro.caltech.edu/pub/pgplot`)

- INES specific software developed at VILSPA, its main components are:

  - IUEdbsMY - perl CGI, main WWW interface
  - MultiDownload.c - multi-file download facility which is offering several compression schemes to save bandwidth and data access logging under MySQL making user of MySQL's C APIs

- SingleDownload.c with data access log under MySQL
- plotspectra.c - on-line plotting of spectra
- pre2_1950.c (precession calculation with subroutines provided by F. Ochsenbein (ESO-IPG), A. Richmond (ESO-IPG) and P.T.Wallace (Starlink))
- FITS_HDU - PERL program to list FITS headers
- IUEserv - PERL program; a quick and dirty proto-type to the Astronomical Server URL (ASU) (see `http://vizier.u-strasbg.fr/doc/asu.html`)

References

Yurrita, I., Barylak, M.: 1997, Access to the ESA IUE Data Server, ESA IUE Newsletter no. 47, Jan. 1997, pg. 34.

Wamsteker W., Driessen C., Munoz J.R., Hassall B.J., Pasian F., Barylak M., Russo G., Egret D., Murray J., Talavera A., Heck A.: 1989, IUE-ULDA/USSP: The On-line Low Resolution Spectral Data Archive of the International Ultraviolet Explorer, A & A Suppl., 79, pg. 1 (was VILSPA IUE Preprint No. 39, January 1989.)

Help on the IUE data server fill-in forms

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Object query keywords

The following keywords can be as input criteria to queries:

Object name

Object name, when shown, is the IUE homogenous object identification. The following hierachy has been adopted by the IUE project:

Catalog	Explanation	Example
0, IUE	IUE specific	IUE NULL
1, HD	Henry Draper	HD 219749
2, BD	Bonner Durchm.	BD +28 5211
3, CD	Cordoba Durchm.	CD -26 1340
4, CPD	Cape Durchm.	CPD -69 2698
5, V*	Variable Stars	V* BF CYG
6, WD	White Dwarfs	WD 2034-53
7, GD	Giclas WD	GD 323
8, NGC	New General Cat.	NGC 4151
9, IC	Index Catalog	IC 2003
10, PK	Perek-Kohoutek	PK 059+09 1
11, MC	Magellanic Clouds	MC SK 80
12, MRK	Markarian	MRK 509
13, ESOB	ESO (B) Catalog	ESOB113-IG45
14, MCG	Catalog of Galax.	MCG +08-11-0011
15, PG	Palomar Green	PG 0108+101
16, QSO	Hewitt Burbidge	QSO 0414-060
17, ABCG	Abell clusters	ABCG36
18, ZZ	Solar System	ZZ COM 1982J
19, NOVA	Novae	NOVAMUS 1983
20, SN	Supernovae	SN 1983N
21, AOO	Any Other Object	AOO PKS 1543+091

For queries, an object ID may refer to both the homogeneous object id. and the target name as given by the guest observer. Both searches are made via an OR condition. Also, wild cards are allowed, use the 'characters. E.g. 'NGC5to uppercase and all blanks will be suppressed.

Position: Right Ascension

Object right ascension must be specified in the format HH:MM:SS. Right ascension must be between 0 and 24 hours.

Position: Declination

Object declination must be specified in the format DEG:MM:SS. Declination must be between -90 and 90 degrees.

Position: Search radius

A search radius around the central RA-DEC can be specified. The region to be searched for is a box. Hence the cosine of the declination is NOT taken into account for the right ascension range.

Search radius must have the format DEG:MM:SS

Position: Epoch

The input coordinates epoch can be either 1900.0, 1950.0 or 2000.0. These coordinates are translated to 1950.0 coordinates, which is the epoch of IUE and hence all output coordinates.

IUE observing class

This field can be filled in with the two-digit IUE observing class defined to be:

IUE OBSERVING CLASSES

———————————————— OBJECT CLASSES 0 - 29 ————————————————

00 Sun	10 W C	20 B0-B2 V-IV
01 Earth	11 W N	21 B3-B5 V-IV
02 Moon	12 Main Sequence O	22 B6-B9,5 V-IV
03 Planet	13 Supergiant O	23 B0-B2 III-I
04 Planetary satellite	14 OE	24 B3-B5 III-I
05 Minor planet	15 OF	25 B6-B9,5 III-I
06 Comet	16 SD O	26 BE
07 Interplanet. medium	17 WD O	27 BP
08 Giant red spot	18	28 SDB
09	19 UV-strong	29 WDB

————————————— OBJECT CLASSES 30 - 59 —————————————

30 A0-A3 V-IV	40 F0-F2	50 R, N OR S TYPES
31 A4-A9 V-IV	41 F3-F9	51 Long Period Variable
32 A0-A3 III-I	42 FP	52 Irregular Variable
33 A4-A9 III-I	43 Late Type Degen.stars	53 Regular Variable
34 AE	44 G IV-V	54 Dwarf Novae
35 AM	45 G I-III	55 Classical Novae
36 AP	46 K IV-V	56 Supernovae
37 WDA	47 K I-III	57 Symbiotic Stars
38 Horizontal Branch	48 M Dwarf	58 T Tauri
39 Composite	49 M I-III	59 X-ray

————————————— OBJECT CLASSES 60 - 79 —————————————

60 Shell Star	70 Planetary Nebula+central star
61 ETA Carinae	71 Planetary Nebula-central star
62 Pulsar	72 H II Region
63 Nova-like	73 Reflection Nebula
64 Stellar Objects not given above	74 Dark Cloud (absorption spectrum)
65 Misidentified Targets	75 Supernova Remnant
66 Interacting Binaries	76 Ring Nebula (shock ionised)

————————————— OBJECT CLASSES 80 - 99 —————————————

80 Spiral Galaxy	90 Intergalactic Medium
81 Elliptical Galaxy	91
82 Irregular Galaxy	92
83 Globular Cluster	93
84 Seyfert Galaxy	94
85 Quasar	95
86 Radio galaxy	96
87 BL Lacertae object	97
88 Emission Line Galaxy(non-seyfert)	98 Wavelength Calibration
89	99 NULLS & Flat Fields

Observing dates

Input observing dates must be specified in the DD-MON-YY format, as in 13-AUG-87.

You may restrict the query by specifying a date range.

Warning: For the from field, date at 00:00:00 is implied. For the to field, date at 23:59:59 is implied. Therefore, 13-AUG-87 to 13-AUG-87 means from 13-AUG-87 at 00:00:00 to 13-AUG-87 at 23:59:59 , that is, the entire day 13-AUG-87.

IUE Camera names

Camera field can be checked for one or more of the available IUE cameras, i.e.:

- LWP : Long Wavelength Prime
- LWR : Long Wavelength Redundant
- SWP : Short Wavelength Prime

In the default form, all cameras are chosen. You may restrict the query by de-selecting the cameras you do not want.

Dispersion

Dispersion field can be checked for one or more of the available IUE spectrograph dispersion modes, i.e.:

- Low : Low resolution spectrograph
- High : High resolution spectrograph
- NA : Not Applicable (NULLs, TFLOODs, UVCALs, etc.)

In the default form, all dispersion modes are chosen. You may restrict the query by de-selecting the ones you do not want.

Aperture

Valid values for the aperture are:

- Large : Large aperture
- Small : Small aperture
- NA : Not applicable (NULLs, TFLOODs, UVCALs, etc.)

Program Identification

All IUE observations belong to a program. The program identification has always 5 characters. In most cases, it consists of two letters followed by three digits.

To restrict the search to a given program identification, this field can be filled in with the desired program id. The search will be case independent, that is, the effect of using/not using capital letters will be the same.

An exact match is required. No partial length strings will be considered.

Observing station

The observations station (GSFC or VILSPA) that acquired the image. Normally, it is also the one that processed it.

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Output control keywords

The following fields are used for output control. They provide means to modify the query output format.

Output

Standard fields include: camera, image, dispersion, aperture, dateobs, timeobs, object, ra, de.

Alt. Fields 1 include: camera, image, dispersion, aperture, iueclas, object, ra, de, target, targra, targde, ecc, abncode, pgm_id.

Alt. Fields 2 include: camera, image, dispersion, aperture, exptime, hjd_mid, posangle, fes2md, fes2cn, station.

In Format

Specifies the output format which can be one of the following:

HTML - providing all direct links to plotting, single file download, principal centre download and IUE publications

ASCII standard ASCII output without links

CSV output is provided as Comma Separated Values enabling easy import into spreadsheets

TSV - output is provided as Tab Separated Values enabling easy import into word processors and spreadsheets

Search limit

This field specifies the maximum no. of spectra to be shown per page matching a given criteria.

Sort options

This field enables the sorting of the images matching the search criteria. Any combination of the shown fields can be chosen. Sorting criteria is ascending for all cases.

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