

## **Catalogue of glow discharge spectra: context of the project and its present state**

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With a widespread use of GDS spectrometers covering continuous wavelength ranges, it is becoming increasingly important to have good reference data on emission spectra produced by different elements in a glow discharge. Most of the existing tables and databases of emission lines reflect another sources, such as ICP and arc/spark. Such sources can be approximately described in terms of excitation / ionization temperatures and spectra of individual elements can be calculated based on transitions probabilities of the transitions involved (if known). Unlike that, excitation in glow discharges depends to a large extent on specific interactions with species related to the working gas and therefore glow discharge spectra differ from those mentioned above and cannot be treated in a similar way. Therefore the existing tables are of limited use for a work with glow discharges.

A project aimed at setting up a catalogue of glow discharge spectra is under way, involving several Gladnet partners. Spectra of some common elements were measured with high resolution on a Fourier Transform Spectrometer down to the vacuum UV region and complementary data were collected by a CCD spectrometer. Sputtering rates of pure metals and alloys used in this work were determined. The catalogue will consist of listings of observed lines of those elements and their emission yields. Experimental details and data processing methods used in this work will be described in the lecture and examples of preliminary results will be presented.

Anticipated use of this catalogue includes different tasks in applications as well as GDS fundamentals. In the applications area, it will help to select best combinations of analytical lines of different elements for a given matrix to be analyzed, to predict line interferences, including their magnitudes, for an instrument with a given resolution, and also to identify selectively excited lines that might be subject to various matrix effects. It will help to generate linelists for wavelength calibration of CCD-based instruments for different matrices and also will give basis for a semiquantitative analysis without calibration on instruments with a slowly varying intensity response function. For fundamental studies, the catalogue data can serve as a general reference source about glow discharge spectra of the elements covered.

Present state of the project will be described and prospects for its completion and extension will be discussed.