

ON POLISH CONTRIBUTION TO THE USE OF SYNCHROTRON SOURCES IN NATURAL SCIENCES

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At the early stage of efforts aiming for building sources of intense radiation in Poland it seems interesting to summarise the scientific output of Polish scientists to the field of synchrotron design, construction, and application of intense sources in materials science (materials physics, chemistry, crystallography, structural biology *etc.*). Recapitulating the design and construction of synchrotron rings and beamlines is worth a dedicated study, we will only mention the important role of Prof. Bronislaw Buras in designing the synchrotron rings at Hasylab and ESRF (mentioned in [1]) during his employment (from 1970's to 1990's) in Denmark, some contribution of Institute of Nuclear Research (later Institute for Nuclear Studies) in Swierk in construction of several rings in Europe, and a joint contribution of a number of scientific institutions in Poland to the design of free electron lasers at DESY. The activity of commercial enterprises in this field such as KUMA/Oxford Diffraction (advanced diffractometers at beamlines at ESRF and at Pohang Light Source) or Prevac is worth mentioning.

In the present study we will focus on the scientific papers produced with participation of Polish (or foreigners affiliated in Poland) authors/co-authors. The first literature search plus the data provided by many Polish authors permitted to construct a list of about 1100 papers that was published at the PSRS webpages in 2006. In the collected data the publications connected with high-energy physics and with astrophysics are not included. Further efforts permitted to extend the list to more than 1630 scientific publications, covering the period 1977 - beginning of 2008.

The pioneering experimental studies have been performed by A. Kisiel starting from mid 1970s. These investigations were followed by other, mostly young, scientists at non-dedicated and (later) at dedicated synchrotron sources in Europe and in United States (also in Canada and Japan) (see, *e.g.* [2-3]). The studies including the (mostly experimental) results connected with intense sources resulted, also, in tens of MSc, PhD and DSc theses at many universities in Poland.

About 50% of the scientific papers were published in 35 journals that can be termed as 'popular' (*i.e.* at least 10 papers in each of them). The most popular are *Journal of Alloys and Compounds* (166 papers), *Acta Physica Polonica A* (147), *Physical Review B-Condensed Matter* (90), *Surface Science* (38) and *Journal of Physics: Condensed Matter* (35). The number of papers in high-

impact-factor journals is about 70 (*Physical Review Letters* 24, *Chemical Physics Letters* 17, *Applied Physics Letters* 14, *Nature* (various mutations) 6, *Europhysics Letters* 4, *Science* 2). The total number of publication in biological periodicals and crystallographic journals are also high. Such papers start also to appear in journals devoted to medicine. In recent years, the number of papers exceeds 150 per year and tends to systematically grow (see Fig. 1). Building a database of Polish publications in the field of intense radiations sources and their applications is anticipated. The already found data will be available at the PSRS webpages and linked to the CPS webpage. Extensions, supplements and corrections are welcome.

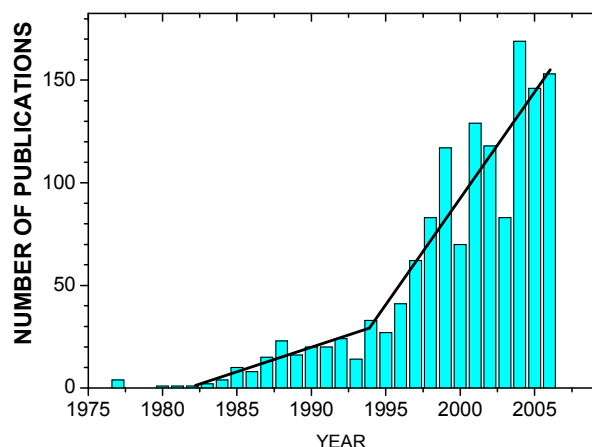


Figure 1. Polish publications in journals and books connected with intense radiation sources and their applications.

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References

- [1] L. Gerward, this issue.
- [2] W. Wierchowski, this issue.
- [3] G. Kowalski, this issue.
- [4] A. Kisiel, this issue.