

Bibliometric Profile of Chinese Research Based on Science Map



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Introduction

A lot of practices and studies of profiling research have been completed in recent years. Research in university or country was profiled through the publications' citation and co-authorship to assess the scientific outputs and impact in the various programs or in certain field (CREST and CWTS, 2006; Evidence, 2007; EPEC, 2009). Many indicators were developed under four categories (Forfas and HEA, 2009) and evaluation of indicators were discussed (Universities UK, 2008). Apart from citation, bibliometric analyses were expanded to include normative comparisons across journals and fields, visualization of co-authorship across the networks (Scott R. Rosas, et al., 2011).

Besides these bibliometric indicators above, a tool, Science Map is prevalent to profile research outputs and collaborations of one country, institution and field based on ISI's journals and subject categories (K.W. Boyack, et al., 2005; K.W. Boyack, 2009; I. Rafols, et al., 2010).

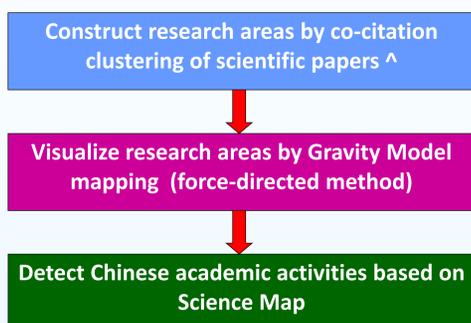
This study assess a country based on the almost whole research areas generated by clustering of highly cited papers instead of journals and subject categories. The key resolution is that Science Map is generated to provide a global view first, and the information of a country is overlaid on the map to profile the country's research.

Data and Methods (J.F. Pan, et al., 2010)

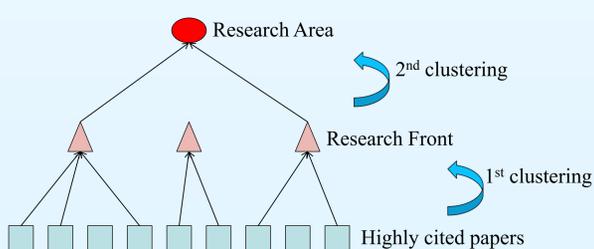
Data Collection

The dataset contains 53892 highly cited papers for the period of 2002.1-2008.4 from ESI as cited papers and all papers in SCI-CD (2002-2007) as citing papers.

Methods



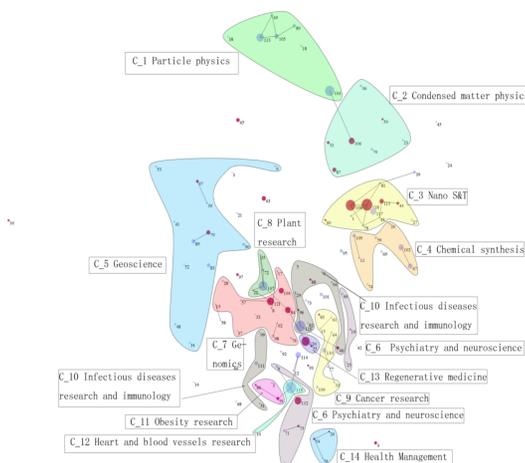
^ Science Map is created by co-citation clustering of highly cited papers from ESI.



Research areas are identified through two steps to cluster cited papers. Clusters of papers obtained through the first and second clustering are referred to as Research Front and Research Area, respectively.

Results

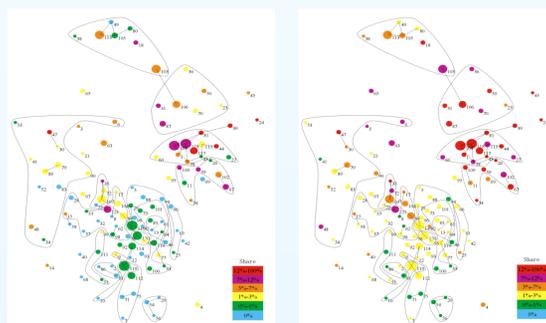
Science Map contains 121 research areas generated after co-citation clustering and is visualized through Gravity Model mapping.



121 research areas are divided into 14 categories except for Bio-other, Med-other and Other categories through content analysis by experts.

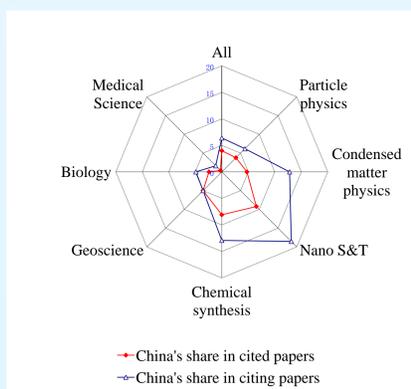
Top: physics; left: Geoscience; mid and bottom: life science; right: chemistry. Life science has the largest area.

Shares of cited and citing papers in certain research area of Science Map are the key indicator for measuring one country's research activities. The cited share represents the quality of research, while the citing share implies the sign of catch up especially for the developing countries.



China's share of cited papers (left) and citing papers (right) in each research area, showed in Science Map. Top-right area is warmer than other areas in both maps.

China's share in Nano S&T is higher than other categories in both cited and citing papers. However, the share in Medical science is the lowest.



Biology: Genomics, Plant research, Bio-other

Medical Science: Cancer research, Infectious diseases research and immunology, Obesity research, Heart and blood vessels research, Psychiatry and neuroscience, Regenerative medicine, Health management, Med-other

China participated in most categories but Obesity Research, Health Management.

Category	# of Research Area	Research Area in which China participated		
		#	%	
Particle physics	7	6	86%	
Condensed matter physics	7	7	100%	
Nano S&T	11	11	100%	
Chemical synthesis	7	7	100%	
Geoscience	12	10	83%	
Biology	Genomics	13	7	54%
	Plant research	4	3	75%
	Bio-other	4	2	50%
Medical Science	Cancer research	7	5	71%
	Infectious diseases research and immunology	11	5	45%
	Obesity research	3	0	0%
	Heart and blood vessels research	2	1	50%
	Psychiatry and neuroscience	8	3	38%
	Regenerative medicine	2	2	100%
	Health management	3	0	0%
	Med-other	9	5	56%
Other	11	10	91%	
Total	121	84	69%	

Chinese participation in one research area is that there is at least a Chinese author in the papers of the research area.

Conclusions

A method based on Science Map is proposed to profile Chinese research. The map, created through the clustering of highly cited papers and content analysis of experts, remove the restriction of field division by journals and subject categories and provide a global view on science.

China's research is more active to produce more papers than before. China has the 6th rank (4.0%) of cited papers in Science Map from 2002 to 2008 in the world, just behind US, EU15, UK, Germany, Japan. China has the most papers than other developing countries. It suggests that research activities in China are growing fast recently.

China is ranked highly in amount of papers, however, the distribution of papers is low of balance within fields. China's papers mostly focus on chemistry and physics, but in life science, especially medical science, China has very low share in both cited and citing papers. This indicates that China should take steps to encourage more activities in the life science.

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