1. Record	d Nr.	UNINA9910726292103321
Titolo		Physics and Applications of Hydrogen Negative Ion Sources / / edited by Marthe Bacal
Pubbl/	/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN		9783031214769
Edizio	ne	[1st ed. 2023.]
Descri	izione fisica	1 online resource (622 pages)
Collan	ia	Springer Series on Atomic, Optical, and Plasma Physics, , 2197-6791 ; ; 124
Discip	lina	546.2
Sogge	etti	Plasma (Ionized gases) Surfaces (Physics) Particle accelerators Atomic structure Molecular structure Plasma Physics Surface and Interface and Thin Film Accelerator Physics Atomic and Molecular Structure and Properties
Lingua	a di pubblicazione	Inglese
Forma	ato	Materiale a stampa
Livello	bibliografico	Monografia
Nota o	di bibliografia	Includes bibliographical references.
Nota c	di contenuto	Chapter 1. Fundamental processes of hydrogen negative ion production in the ion source plasma volume Chapter 2. Fundamental aspect of surface production of hydrogen negative ions Chapter 3. Modelling of reaction dynamics in volume production negative hydrogen ion sources Chapter 4. Particle-In-Cell Modelling of Negative Ion Sources for fusion applications Chapter 5. Particle-In-Cell Modelling with Monte-Carlo Collision of Extraction and Acceleration in Radio- Frequency Negative Ion Sources Chapter 6. Plasma neutralisation of 500 keV H- ions Chapter 7. Advanced models for negative ion production in hydrogen discharges Chapter 8. The plasma sheath in negative ion sources Chapter 9. Helicon volume production of H and D using a resonant birdcage antenna on RAID Chapter 10. Plasma electrode for Caesium free negative hydrogen ion sources

	Chapter 11. Low temperature high density ion source plasma Chapter 12. Fundamental principles of ECR-driven negative ion sources operating with hydrogen and deuterium Chapter 13. Dissociative electron attachment to hydrogen and its use for vibrational spectroscopy of hydrogen molecule Chapter 14. Physics of surface- plasma H- ion sources Chapter 15. Hydrogen negative ion density diagnostic in plasma Chapter 16. RF Driven ion sources for Fusion NBI Chapter 17. Negative ion source technique and technology Chapter 18. Radiofrequency driven, Pulsed High-current H- Ion Sources on Advanced Accelerators Chapter 19. Development of High Current Negative-Ion based Beam Source at QST for JT-60U and ITER Neutral Beam Injectors.
Sommario/riassunto	This book gives a comprehensive overview of hydrogen negative ion sources and their applications to particle acceleration and nuclear fusion. The book begins with fundamental aspects of negative ion production by volume and surface processes in hydrogen and its isotopes. It covers key topics, such as the need for separation of negative ion production and extraction regions, the need for lowering the work function of the plasma electrode by using caesium vapor or special materials for caesium-free sources, and the ion extractor structure required for hydrogen negative ion sources. Chapters covering various specific ion sources and applications are written by scientists who participated in their development and include sources for accelerators and for neutral beam injection into controlled nuclear fusion reactors.