

Title (en)

Device and method for the intensity control of a beam extracted from a particle accelerator

Title (de)

Vorrichtung und Verfahren zur Steuerung der Intensität eines aus einem Teilchenbeschleuniger extrahierten Strahls

Title (fr)

Dispositif et méthode de régulation de l'intensité d'un faisceau extrait d'un accélérateur de particules

Publication

EP 1265462 A1 20021211 (FR)

Application

EP 01870122 A 20010608

Priority

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Abstract (en)

The beam intensity regulator includes an analogue-digital converter (50) which converts an analogue signal (IM) directly representing the measured beam intensity at the accelerator output into a digital signal (IR). A low pass filter filters the signal (IM) to produce a filtered analogue signal (IF). A phase advance regulator samples the signal (IF), compensates for the phase delay and provides the signal (IR) to a comparator (90). An Independent claim is also included for: a regulation method. Beam intensity regulator, for beams extracted from a particle accelerator such as a cyclotron, used for proton-therapy. The particles are generated from an ion source. Regulator includes: (a) a comparator (90) determining the difference (η) between a digital signal (IR) representing beam intensity measured at the accelerator output and a set value of beam intensity (IC); a SMITH predictor (80) which determines from (η), a corrected value beam intensity value (IP); an inverse correspondence table (40) furnishes, from the corrected value (IP), a value (IA) for supply of a current arc for the ion source (20).

IPC 1-7

H05H 13/00; H05H 7/00

IPC 8 full level

A61N 5/10 (2006.01); **H05H 7/00** (2006.01); **H05H 13/00** (2006.01); **H05H 13/04** (2006.01)

CPC (source: EP US)

H05H 7/00 (2013.01 - EP US); **H05H 13/00** (2013.01 - EP US)

Citation (search report)

- [DA] WO 0040064 A2 20000706 - ION BEAM APPLIC [BE], et al
- [A] FR 2539867 A1 19840727 - THOMSON CSF [FR]
- [A] FR 2749613 A1 19971212 - RENAULT [FR]
- [A] V.J. VANDOREN: "The Smith Predictor: A Process Engineer's Crystal Ball", CONTROL ENGINEERING, May 1996 (1996-05-01), pages 61 - 62, XP000638018

Cited by

US8410730B2; EP2259664A3; EP3294045A1; EP3557956A1; US9723705B2; USRE48047E; WO2010149740A1; WO2009056165A1; US9451688B2; US8896238B2; US9681531B2; JP2011501391A

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DOCDB simple family (application)

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