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Turn-by-turn measurements of the energy spread at negative momentum compaction factor at KARA

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The Karlsruhe Research Accelerator (KARA), the storage ring at KIT, allows short electron bunch operation with positive as well as negative momentum compaction factor. For both cases, the beam dynamics are studied. Using a line array camera KALYPSO (KArlsruhe Linear arraY detector for MHz rePetition rate SpectrOscopy), based on TI-LGAD, the horizontal intensity distribution of the emitted visible part of the synchrotron radiation is measured at a 5-degree port of a bending magnet on a turn-by-turn time scale. As the measurement is located at a dispersive section, the dynamics of the energy spread can be studied by measuring the horizontal bunch profile. The MHz acquisition rate and the low-light sensitivity of the line camera allow measurements at low bunch currents and the investigation of the microbunching instability. This contribution presents the results of the bunch profile measurements performed at positive and negative momentum compaction factor.

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Footnotes

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