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Prototyping of permanent magnet based drift tube for KOMAC 100-MeV DTL

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A high-power proton linac at KOMAC uses a drift tube linac structure to accelerate protons up to 100 MeV. Currently, a total of 148 drift tubes with electromagnetic quadrupoles are used in DTL sections for accelerating protons from 3 MeV to 20 MeV. A drift tube based on a permanent magnet quadrupole has been designed and prototyped to replace the EMQ-based drift tube to enhance the DTL reliability. A designed PMQ with an integrated field gradient of 1.6 T is assembled from 16 segments, which are made of Sm₂Co₁₇ magnetic material for its radiation hardness. Details of the prototyping study on the PMQ including design, fabrication, and test along with the beam dynamics effects are given in this presentation.

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Footnotes

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