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Development of Beam Diagnostic System for Natural Rubber Vulcanization Linac

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This research focuses on design and development of beam diagnostic system of an electron linear accelerator (linac) for natural rubber vulcanization at the Plasma and Beam Physics Research Facility, Chiang Mai University. The main components of the accelerator include a DC thermionic electron gun and an S-band standing-wave linac. The system will be used to produce electron beams with adjustable energy in the range of 0.5 to 4 MeV and a pulse repetition rate of 20 to 400 Hz with the maximum pulse duration of 4 μ s. The maximum electron pulse current is expected to be 100 mA. Design and development of beam diagnostic instruments to measure electron beam energy, pulse current and electron dose are underway. The beam energy will be measured in ambient air after the beam exiting the linac by using a dipole magnet, a phosphor screen and a CCD camera. Measurements of current and charge of electron beam are performed by using a current transformer and a Faraday cup, respectively. This contribution will describe and discuss on the results of the design and construction of the beam diagnostic system as well as the results of the beam measurement.

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