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**Feasibility study on various optics design for X-pinch high voltage measurement system using the Pockels electro-optic effect** SEONGMIN CHOI, ALVIN SUGIANTO, DONG-GEUN LEE, Department of Nuclear and Quantum Engineering, KAIST, Daejion, 34141, H.J. WOO, S.H. HONG, Agency of Defense Development, Daejeon, 34186, SEUNGGI HAM, JONGHYEON RYU, KYOUNG-JAE CHUNG, Y. S. HWANG, Department of Nuclear Engineering, Seoul National University, Seoul, 08826, Y.-C. GHIM, Department of Nuclear and Quantum Engineering, KAIST, Daejion, 34141 — We develop an optics-based high voltage sensor applicable to X-pinch plasma source using a Pockels cell which changes the refractive index according to the intensity of externally applied electric fields. The developed voltage sensor has a nsec temporal resolution allowing us to follow dynamics of X-pinch plasmas. In addition, since the sensor works as a polarimetry, it makes no electrical contacts with the X-pinch system where a high voltage (˜100 kV) with the fast rising (˜nsec) time is applied. Various optics configurations for the sensor are designed and examined on the X-pinch system without plasmas by applying a voltage up to a few tens of kV with a rising time of ˜10 nsec. We present the investigated optics configurations and discuss their performance.

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