Purpose: To compare an advantage/disadvantage between Field-in-Field (FIF) technique and conventional physical wedge (PW) technique for a whole breast (WB) tangential field irradiation.

Methods and Materials: Total 86 patients were included in this study. 46 of them were left breast cancer cases. FIF/PW plans were created by Eclipse (V7.3, Varian) with 6MV or 6MV mixed with 18MV. Plans had a same isocenter location, beam setup and normalized isodose line selection for each case. Varian 21EX Linac with 120 MLC was used for beam delivery. Two plans were compared by PTV encompassed by 95% isodose line (V95), dose inhomogeneity (DI), dose received by 10% volume of lung (D10), mean lung dose (MLD), dose received by 5% volume of heart (D5), Mean heart dose (MHD), total MU, maximum dose in the plan and the number of field needed for each fraction.

Results: Comparing with PW plan, FIF plan showed an average percentage improvement of V95 was 0.1±1.6, DI was 0.6±5.0, MLD was 1.5±4.2, D5 was 2.0±8.8, MHD was 3.2±4.6. However, D10 increased by 1.4%±0.050. FIF lowered an average daily MU by 28.5%±0.080, maximum dose by 0.5%±0.018, and increased number of treatment field by 1.50±0.356. There were 12 cases treated with mixed beam in PW technique vs 10 in FIF technique.

Conclusion: The advantages of FIF technique included: (1) Reduce radiation contamination to contralateral breast and Linac room induced activity by remove the PW, lower MU and diminish a higher energy. (2) Time saving was not only from less MU but also from not need go into the treatment room for a wedge adjustment. (3) Reduced the therapist work load. (4) Regular MU 2nd check was applied because there was not FIF merge involved in the treatment field. With a MLC to shape the field and treatment record/verification system to control the treatment, increasing number of treatment field didn’t show as a problem.