Limiter heat loads during the first operation of the W7-X stellarator  

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sin, Madison, W7-X TEAM\textsuperscript{1} — During the first operational phase (OP1.1) of the 
new W7-X stellarator, five poloidal graphite limiters served as the main boundary 
for the plasma. There was a dedicated set of diagnostics to observe the performance 
of the temporary poloidal limiters and infer basic transport behavior of the 3-D 
helical SOL plasma. We describe IR imaging of the limiters, which resulted in ob- 
servations of 1) heat flux determination as a function of time and space, 2) total 
energy into the limiters, 3) high-frequency helical patterns of energy bursts onto the 
limiters, 4) changes in surface emissivity, and 5) detection of UFO’s (small-to-large 
dusts). These measurements were made in 2 magnetic configuration discharges (dif- 
fering iota), and in ones where the power loads to the limiters were systematically 
modified by the use of trim coils. Observed power fractions on the limiters ranged 
from 40% to 20% of the 0.6 to 4 MW ECRH input powers. 

\textsuperscript{1}Acknowledgement: Funded under DOE LANS Contract DE-AC5026NA25396 and 
DE-SC0014210, and within the EUROfusion Consortium under Euratom grant 
633053.