L-Mode Confinement in Toroidal Devices JOSEPH GORMAN, (retired; Westinghouse Research) — A loss-cone in velocity space exists in toroidal devices. Particles having low velocities parallel to the main confining field, B, can gradBXB drift, somewhat uncompensated, toward the scrape-off layer. An analysis of this effect leads to the formulation for the plasma confinement time, τ, in seconds viz., $\tau = 10^{15}$ BTr/n where B is the confining magnetic field in Tesla, T is the electron temperature in eV, r is the plasma minor radius in meters and n is the plasma density in m^{-3}. This equation predicts the plasma confinement times of stellarators and tokamaks,in the L-Mode, that agree with experiments to within about a factor of two. The agreement extends to data from experimental fusion devices, big and small, conducted world-wide during the past several decades. The origins of this semi-empirical formula and the good fit it provides to the experimental data will be presented and discussed.

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