

INFLUENCE OF QUANTUM POWER LAW TAILS ON FUSION RATES
IN EQUILIBRIUM PLASMAS OF ASTROPHYSICAL OBJECTS
AND IN LABORATORY CONDITIONS

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The influence of quantum effects on equilibrium rates of fusion reactions in dense plasmas is discussed. It is shown that reduction of 12-fold integrals, describing fusion reaction rate to 5-fold is possible, and under some conditions, we obtain explicit expressions for such reaction rates. Our calculations using “exact” expression by Monte-Carlo methods and by explicit formulas shows that quantum effects significantly influence on the reaction rates of $p+Be^7$, He^3+He^4 , $p+Li^7$, $C^{12}+C^{12}$, etc. type reactions and new reaction rates may be much higher than the classical ones for the interior of the Sun and supernova stars. The possibility to observe the theoretical predictions in the laboratory conditions is discussed.