

# Power for The Hour: On analogies and approximations of phenomenological models

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We present a phenomenological model to study the power applied by a cyclist on a velodrome.

Following justifications of expressions that constitute this mathematical model, we present a numerical example. Also, we examine changes in the required power due to changes of various quantities, such as air density and laptime, as well as the model sensitivity to input errors. Furthermore, we examine the effects on power of slight and gradual changes of speed, which goes beyond the initial assumptions of the model.

This work has been used in strategizing the performance for the Hour Record. Notably, scenarios generated with our model were taken into consideration prior to two successful Hour Records in 2022, by Dan Bigham and by Filippo Ganna.