

exponentiate a matrix

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- *From:* "questions?" <universal_used@xxxxxxxxxxx>
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I have a rate matrix say Q . It has only real eigen values.
The trouble is: I want to exponentiate the matrix to a small power. In other worlds, the $\text{Exp}(Q^{\text{power}})$ is very close to an Identity matrix in a sense that the off diagonal are very close to zero, but diagonal is very close 1.

I used the GNU Scientific library, but it occasionally gives negative entries when the powers are small. $\text{Exp}(Q^{\text{power}})$ is a transition probability matrix, the entries shouldn't be negative.

Are there other packages in C that can deal with high precision calculations in matrix?

Thanks for any comments

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