Indirect Search for New Dynamics -by Cunning

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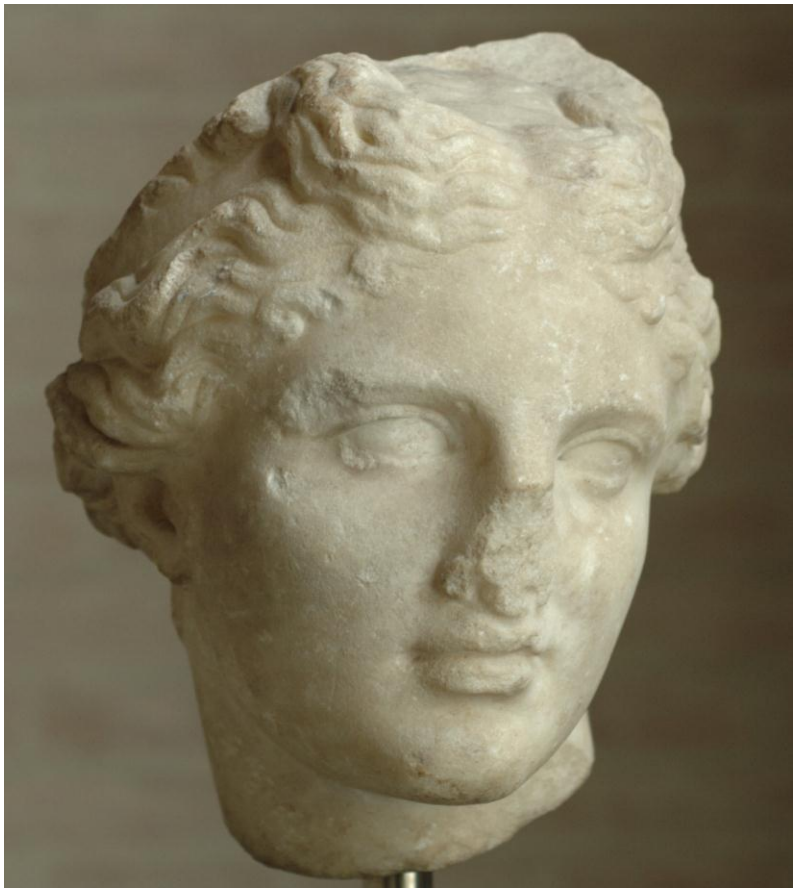

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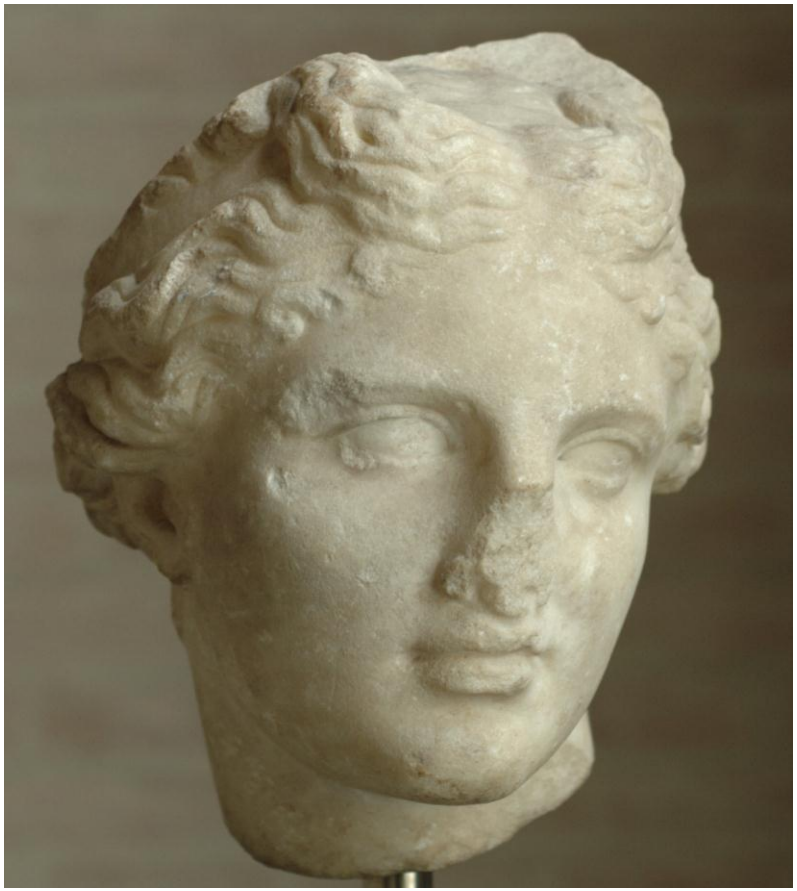

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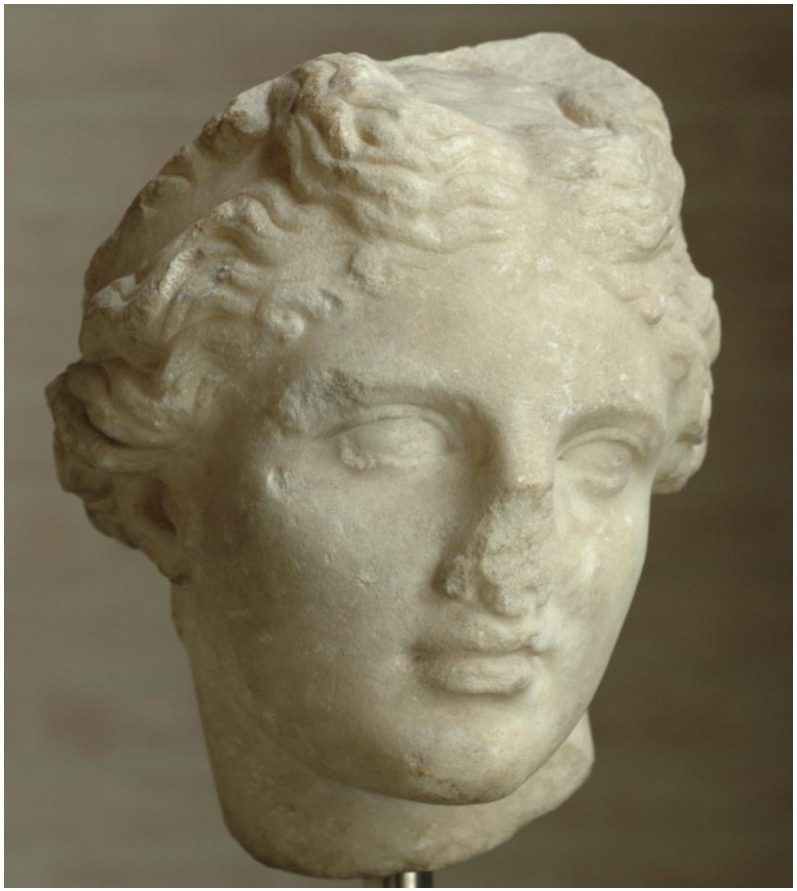

minor asymmetry enhances their beauty & charm

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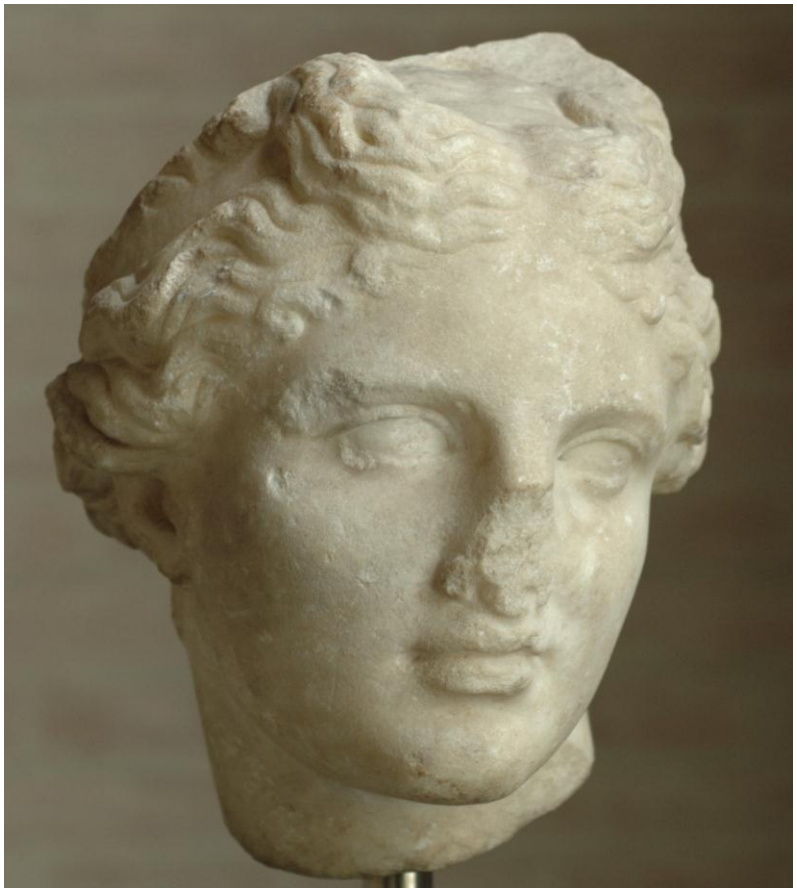

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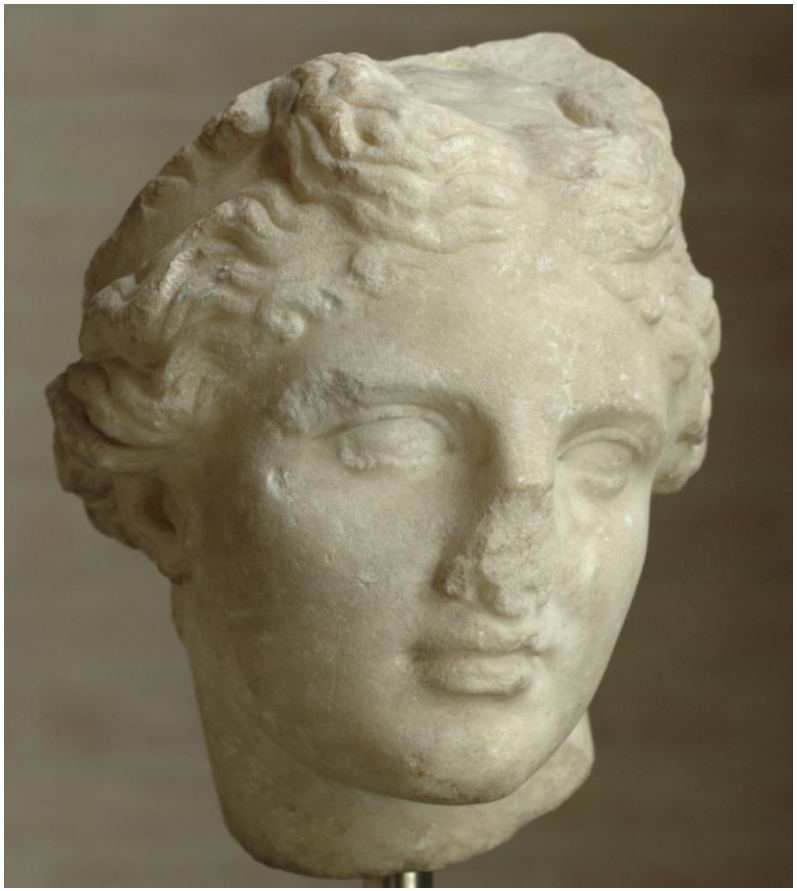

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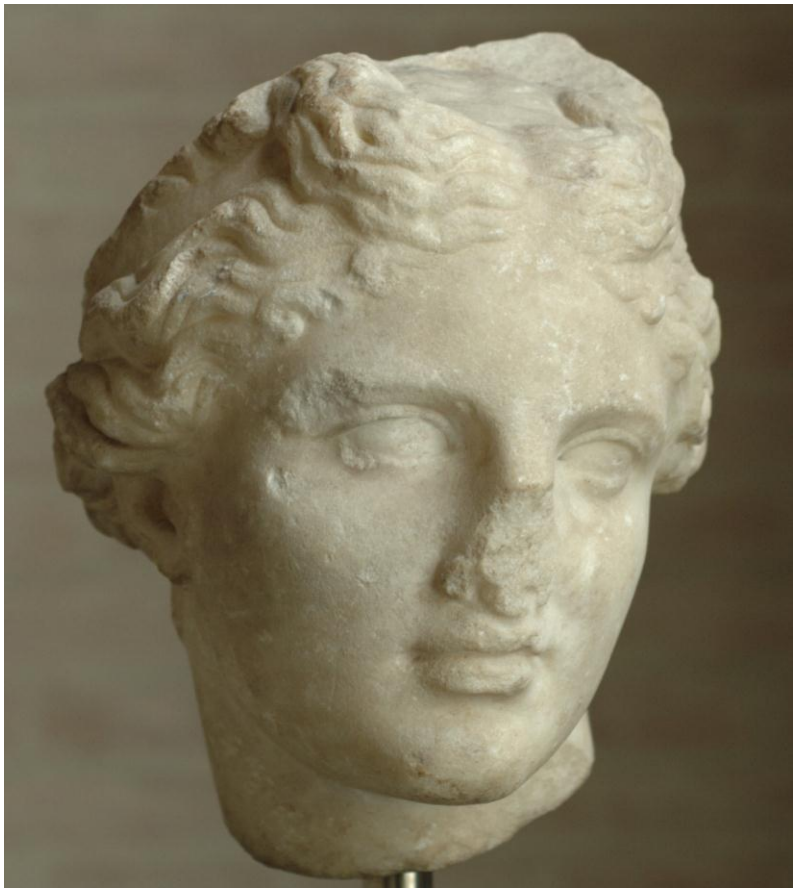

CP asymmetry enhances Beauty & Charm decays!

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✧ find out its shape & nature

Status

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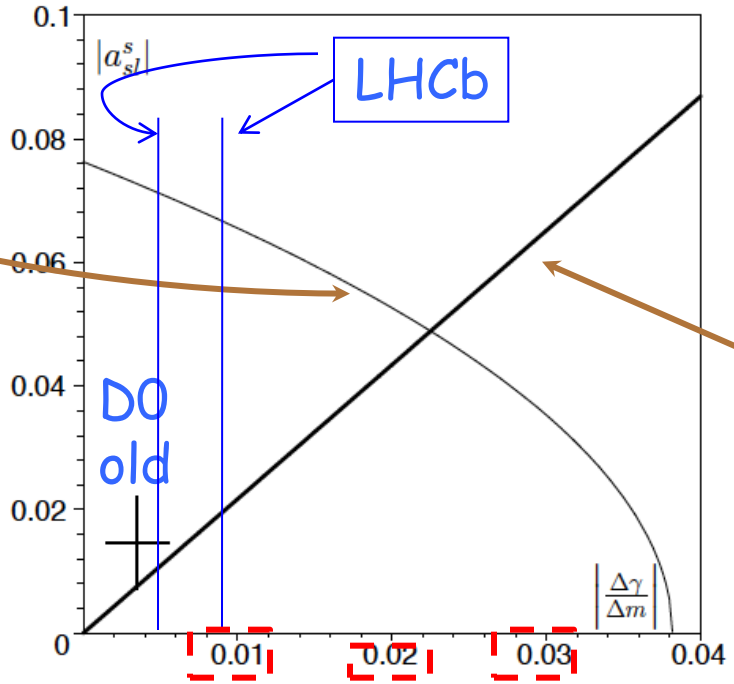
with input from LHCb satisfies Bell-Steinberger-Berger-Sehgal bound *just*

unitary bound



monotonicity of oscillations = `time *not* running backward'

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  - accuracy & *complementarity*!

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No golden test of flavour dynamics -- you have to rely on a series of several arguments with correlations!

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single path to heaven - asymmetries in the Dalitz plot

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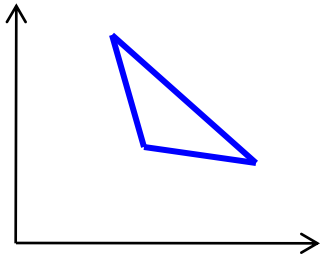
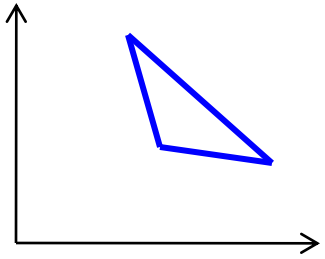
`Miranda' procedure

pattern recognition learnt from astronomers

Bediaga et al.:`significance' $[N(i)-\bar{N}(i)]/[N(i)+\bar{N}(i)]^{1/2}$

Formalism of Dalitz plots





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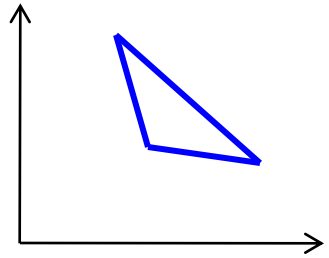

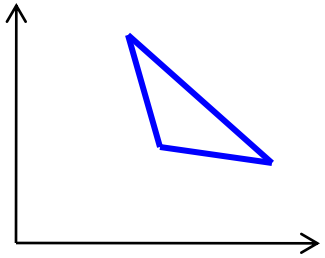

DP depend on $|T(3P)|^2$ vs. $|\overline{T}(3P)|^2$, weak & strong phases
Analyze the topologies of Dalitz plots

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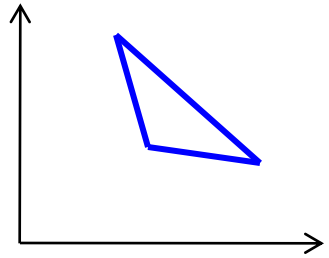

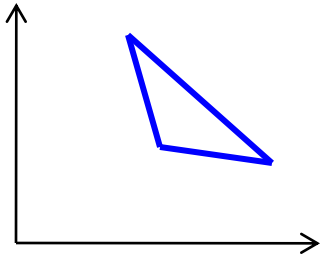

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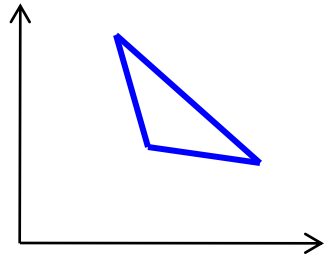

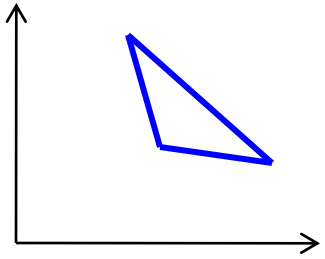

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- most CP asymmetries in the DP are *in*dependent of production asymmetries!

theoretical guidance: B/D → PPP

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- with quasi-2-body final states (resonances)
- with interference between quasi-2-body final states
- contributions from true 3-body FS or broad resonances like σ.

One example:

$$D/B_d \rightarrow \pi^+\pi^-\pi^0 \leftarrow D/B_d$$

$\rho^0\pi^0$, $\rho^{+/-}\pi^{-/+}$, $f_0(980)\pi^0$, $\sigma\pi^0$

V+P, *V+P*, *S+P*, *S+P*

BW, BW, ~ BW, *not* BW!

BW = Breit-Wigner

experience of HP/MEP very useful!

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Remember –
finding the Devil on a fresco in the Basilica San Francesco in Assisi in Italy painted in the 14th century took till now!

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Lagrangian   Observables

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LHCb!

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	theor. *pre*[post]dictions		WA data
$\tau(\Lambda_b)/\tau(B_d)$			
	`us' 0.9 - 1.0	'93	0.77 ± 0.05
'96			
	`us' 0.94±0.03, >0.88	'96,'98	0.79 ± 0.05
'99			
	`not us' 0.86±0.05	'03	0.806 ± 0.05
'03			
			0.939 ± 0.022
'11			