



Summary and Closeout

Lectures at the "School on Concepts of Modern Amplitude Analysis Techniques"



School on Concepts of Modern

Amplitude Analysis Techniques

Summerschool, September 18-26, 2013
Flecken-Zechlin, Germany

Amplitude analysis is a mandatory tool to study few-particle decays, since the resulting spectra (Dalitz plots and generalizations thereof) in general contain very rich structures. These structures teach us a lot about the spectrum of hadrons and their intrinsic properties to unveil e.g. the mystery of strong binding and the question of a much richer spectrum than only conventional mesons and baryons. But the physics opportunities reach much beyond this. Any observable appearing in interference effects of hadron production and decay will be accessible this way, which opens the door to electroweak physics and physics beyond the standard model.

For the analysis of precision experiments at PANDA, BESIII, LHCb, JLab 12 GeV, COMPASS, BaBar and Belle II, the Helmholtz Institute Mainz is organizing a two week advanced course covering Techniques of Amplitude Analysis, aimed at advanced doctoral students and postdoctoral researchers in hadron and particle physics. This school is especially dedicated to experimentalists.

Confirmed Lecturers
B. Gruber, Munich
J. Peláez, Madrid
K. Peters, GSI
M. Pennington, JLab
S. Scherer, Mainz
A. Szczepaniak, Bloomington

Concepts
Mathematical Tools
Dynamical Aspects
Practical Application
Training

Miriam Fritsch, Mainz
Klaus Götze, GSI
Klaus Peters, GSI
Organizing Committee

Registration until June 10, 2013

For more information: <http://www.him.uni-mainz.de/pwa2013>

Klaus Peters
GSI Darmstadt and GU Frankfurt
Flecken-Zechlin, September 2012

What have we learned



We need

We have

Unitarity

Experimental Data

Analyticity

Limited Statistics

Causality

Phase-space Limitations

Singularities

Computing Limitations

Residues

Fitting Limitations

Isobars

Goal

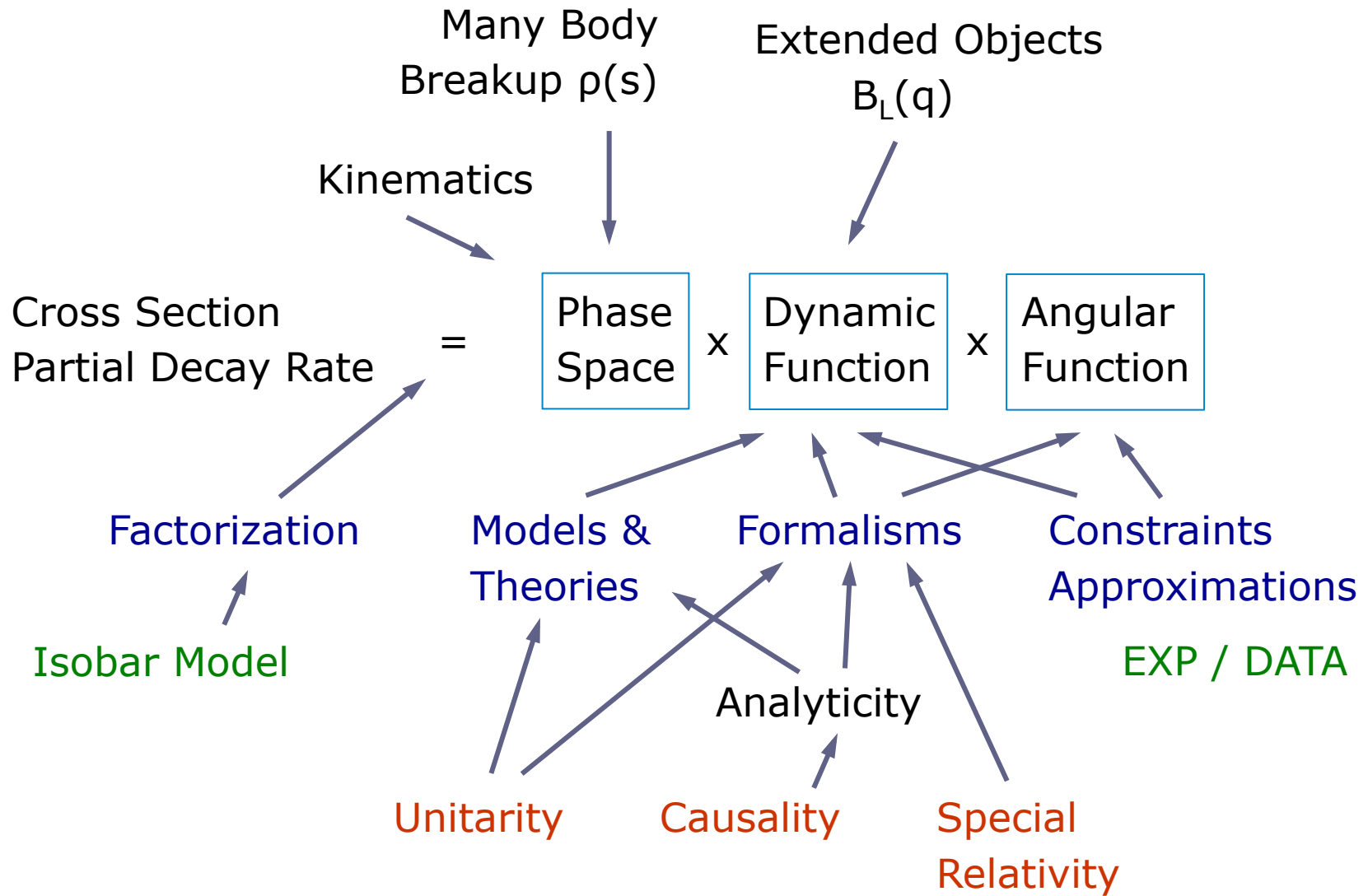
Interferences

the best which is reasonably achievable

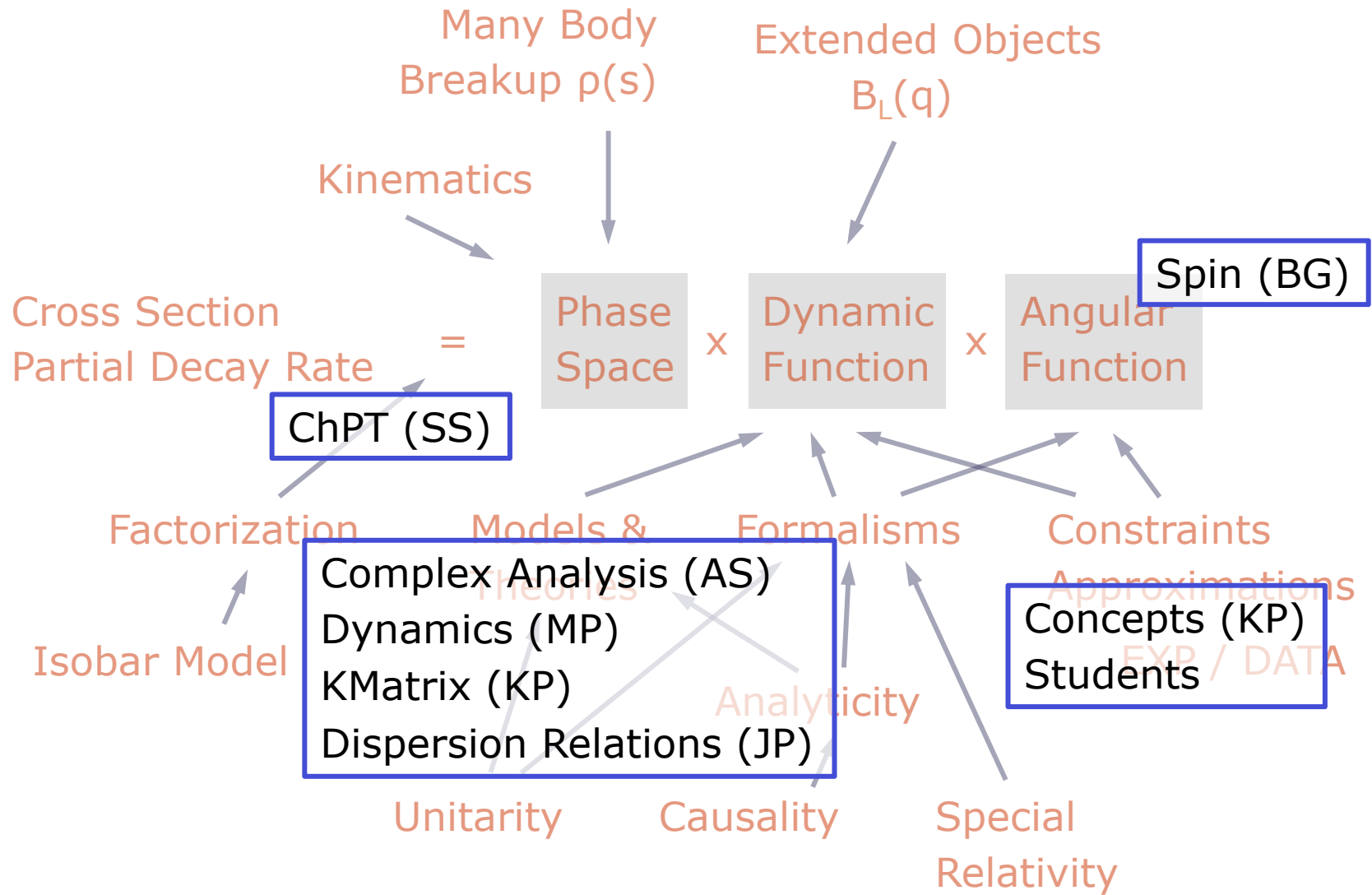


Interferences	↔	Complex Analysis / QM
Unitarity	↔	Conservation of probability / QM
Singularities	↔	Physics
Causality	↔	“Analyticity” of T
Isobars	↔	Factorization ↔ 2-body Problem
Residues	↔	Coupling strength of resonances

The Picture



The Picture





Limitations translate into truncation / modification of amplitudes

Any approximation has to be handled with care, e.g.

Neglect non-Isobar



Dynamic function affected ?

More waves needed ?

Wave cut-off



Mimics non-Isobar ?

Bias to remaining waves?

Barrier damping



Affects Interferences

Scrutinize what you do / have done

We would be happy if you are to apply what you have learned

