Pensieve header: Mathematica notebook for Talks: Beijing-2407.

Ancestors: Projects/APAI/APAI.nb, Projects/APAI/PerturbedGaussianIntegration.nb.

```
In[•]:= SetDirectory["C:\\drorbn\\AcademicPensieve\\Talks\\Beijing-2407"];
```

The Program

pdf

```
In[•]:= Once[<< KnotTheory`; << Rot.m];
```

pdf

```
Loading KnotTheory` version of February 2, 2020, 10:53:45.2097.
Read more at http://katlas.org/wiki/KnotTheory.
```

pdf

```
Loading Rot.m from http://drorbn.net/icbs24 to compute rotation numbers.
```

pdf

```
In[•]:= CCF[ℰ_] := ExpandDenominator@ExpandNumerator@Together[ℰ];
CF[ℰ_List] := CF /@ ℰ;
CF[ℰ_] := Module[{vs = Cases[ℰ, (x | p)_, ∞] ⋃ {x, p}, ps, c},
   Total[CoefficientRules[Expand[ℰ], vs] /. (ps_ → c_) :↦ CCF[c] (Times @@ vs^ps)]];
CF[eqp_EQP] := CF /@ eqp
```

pdf

```
In[•]:= EQP /: c_ * EQP[Q_, P_] := EQP[Q, CF[c P]];
```

pdf

```
In[•]:= {p*, x*} = {π, ξ};  (z_i__)* := (z*)_i;  vs_List* := (v ↦ v*) /@ vs;
Zip_{}[ℰ_] := ℰ;
Zip_{z_,zs___}[ℰ_] := (Collect[ℰ // Zip_{zs}, z] /. f_. z^d_. :↦ (D[f, {z*, d}])) /. z* → 0
```

pdf

```
In[•]:= FI[EQP[Q_, P_]] := FI[EQP[Q, P], Union@Cases[Q, p_, ∞], Union@Cases[Q, x_, ∞]];
FI[EQP[Q_, P_], ps_List, xs_List] := Module[{u, v},
  A = Table[∂_{u,v} Q, {u, ps}, {v, xs}];
  Factor[Det[A]^-1 Zip_{ps⋃xs}[P ℮^(-xs*.Inverse[A].ps*)]]]
```

In[•]:=
```
Unprotect[Integrate];
∫P_. e^L- d(vs_List) :=
  "Let us integrate " <> ToString[{P, L}] <> " with respect to " <> ToString[vs];
Protect[Integrate];
∫e^(p x) d{p, x}
∫Sin[x] e^(p x) d{p, x}
```

Out[•]=
```
Let us integrate {1, p x} with respect to {p, x}
```

Out[•]=
```
Let us integrate {Sin[x], p x} with respect to {p, x}
```