

# Pierre Binetruy – his early career in the Alps



Pierre Salati – LAPTh & Université Savoie Mont Blanc – May 3, 2018

# Pierre Binetruy – his early career in the Alps

**1980** PhD at CERN with M.K. Gaillard

**1983**

**1985**

**1986** Chargé de Recherches at LAPP in Annecy

**1990** Full professor at Paris Orsay U

# Pierre Binetruy – his early career in the Alps

**1980** PhD at CERN with M.K. Gaillard

CERN fellow

**1983**

**1985**

**1986** Chargé de Recherches at LAPP in Annecy

**1990** Full professor at Paris Orsay U

# Pierre Binetruy – his early career in the Alps

**1980** PhD at CERN with M.K. Gaillard

CERN fellow

**1983**

Post-doc at UC Berkeley with M.K. Gaillard

**1985**

Visitor at Florida U in Gainesville and at Chicago U

**1986** Chargé de Recherches at LAPP in Annecy

**1990** Full professor at Paris Orsay U

# Pierre Binetruy – his early career in the Alps

**1980** PhD at CERN with M.K. Gaillard

CERN fellow

**1983**

Post-doc at UC Berkeley with M.K. Gaillard

**1985**

Visitor at Florida U in Gainesville and at Chicago U

**1986** Chargé de Recherches at LAPP in Annecy

Collaboration with G. Girardi and R. Grimm on SUGRA

**1990** Full professor at Paris Orsay U

# Pierre Binetruy – his early career in the Alps

**1980** PhD at CERN

CERN fellow

Starting my PhD at LAPP **1981**

**1983**

Post-doc at UC Berkeley

**1985**

**1986** Chargé de Recherches

Post-doc at UC Berkeley **1987**

CERN fellow **1989**

**1990** Full professor at Paris Orsay U

# Pierre Binetruy – his early career in the Alps

**1980** PhD at CERN

Starting my PhD at LAPP **1981**

**Collaboration on co-annihilation**

**1983**

Post-doc at UC Berkeley

**1985**

**1986** Chargé de Recherches

Post-doc at UC Berkeley **1987**

CERN fellow **1989**

**1990** Full professor at Paris Orsay U

perhaps for the photino, and as such may be submitted to a cosmological analysis.

In this paper we shall be concerned with the study of a coupled system of two

P. BINÉTRUY, G. GIRARDI and P. SALATI

*LAPP, Annecy-le-Vieux, France*

Nuclear Physics B237 (1984) 285–306

configurations for the couplings among these fermions; in particular in the case of large mixing we obtain restrictive bounds on both masses. Our study is relevant to supersymmetric grand unified models which predict the occurrence of light interacting neutral fermions, particularly higgsinos.

## 1. Introduction

Modern cosmology and the standard big bang model [1] provide us with an efficient framework to constrain proposed theories in high-energy physics which are difficult to test in the laboratory [2]. In particular, this approach proved to be very useful concerning weakly interacting particles, such as neutrinos [2] and axions



perhaps for the photino, and as such may be submitted to a cosmological analysis.

In this paper we shall be concerned with the study of a coupled system of two

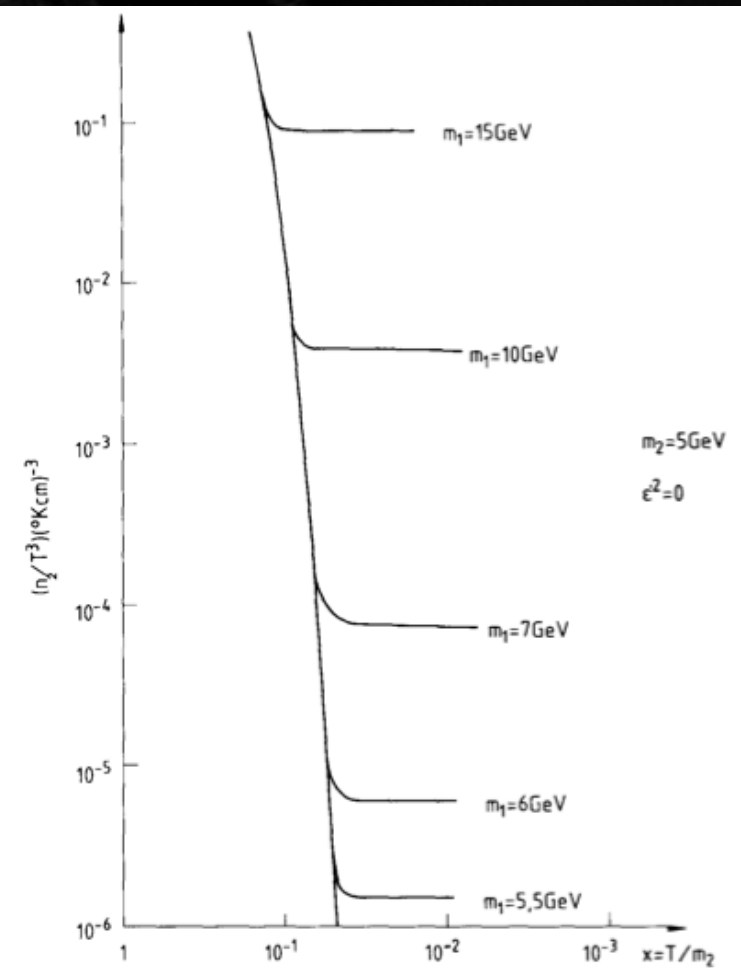
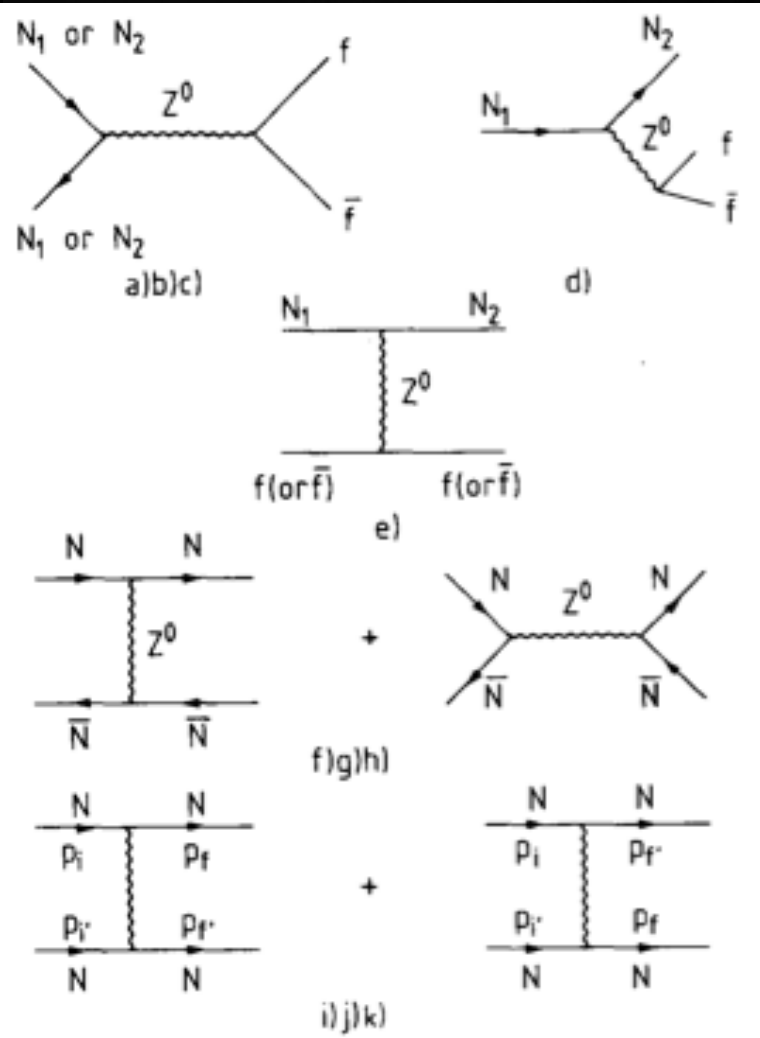


Fig. 4. Evolution of the density  $n_2$  in the case of an antidiagonal coupling ( $\epsilon' = 0$ ) for  $M_2 = 5 \text{ GeV}$  and  $M_1 = 5.5, 6, 7, 10$  and  $15 \text{ GeV}$ .

perhaps for the photino, and as such may be submitted to a cosmological analysis.

In this paper we shall be concerned with the study of a coupled system of two

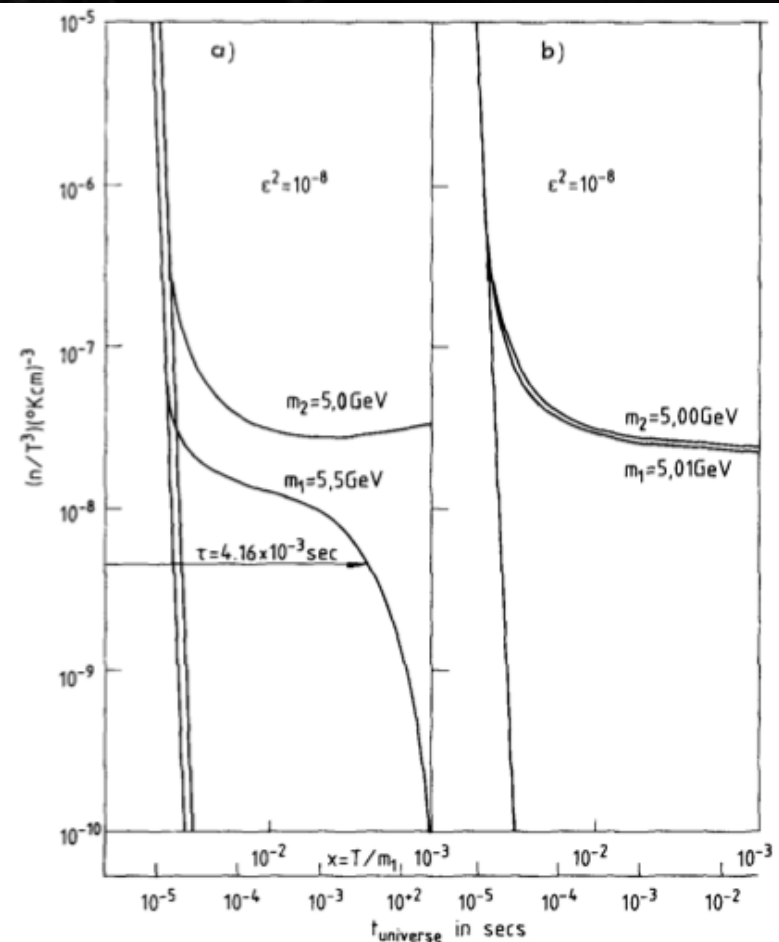
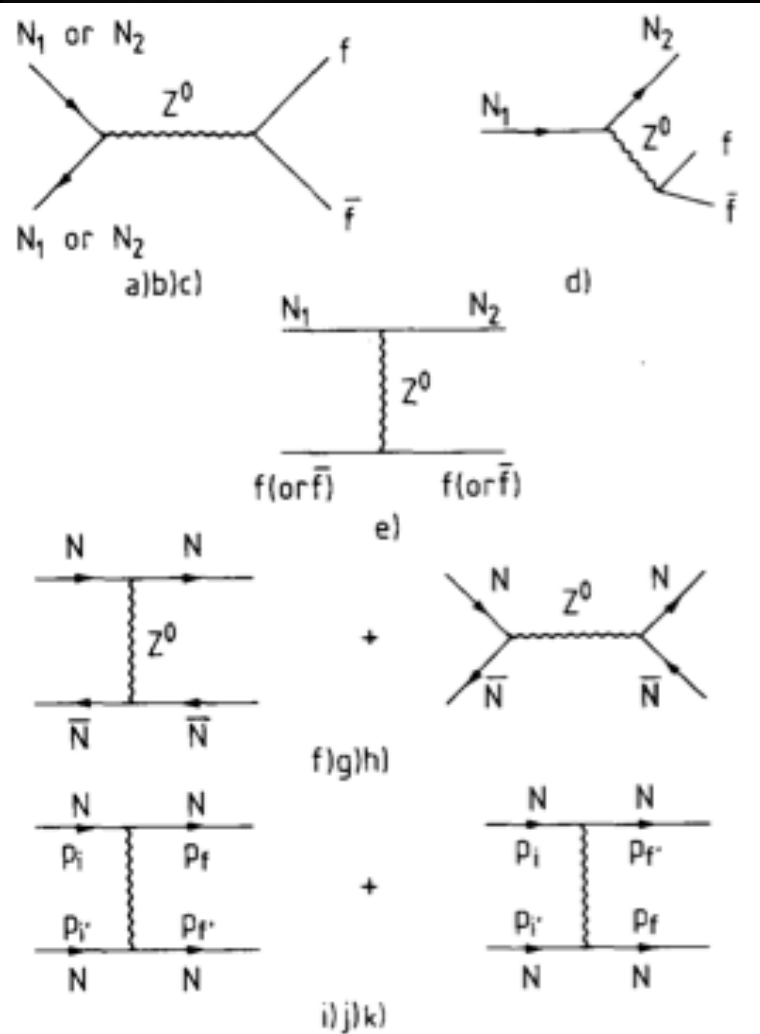


Fig. 2. Evolution of the densities  $n_1$  and  $n_2$  in the quasi-diagonal case for  $M_2 = 5.0 \text{ GeV}$ ,  $\epsilon^2 = 10^{-8}$  and (a)  $\Delta M = 500 \text{ MeV}$  (b)  $\Delta M = 10 \text{ MeV}$ . The steep curves (which are placed on top of each other in case (b)) are the equilibrium densities.  $\tau$  is the lifetime of fermion  $N_1$ .

# Pierre Binetruy – his early career in the Alps



Thank you, Pierre, for paving our road,  
for your generosity, kindness and dedication

**We miss you**