

**Subgroup Report:  
Astrophysical Source Identification  
and Signature (ASIS)**

**Bruce Allen  
LSC General Meeting  
Stanford University  
July 19, 1999**

# Web Site

- **Archived agenda/meeting minutes**
- **Mailing list:**
  - 94 Subscribers as of July 16th**
  - All messages archived**

## Meetings since March 1999

- **May 6, 1999: Conference Call**
- **June 7, 1999: Conference Call**
- **July 13: face-to-face at Amaldi Conference**
- **Meeting every 6 weeks about right**
- **Issue: non LIGO-I/LSC participation in ASIS meetings**

# May 6, 1999: Conference Call

- 27 people
- Groups represented:

AEI

Cardiff

Caltech

**CFA**

Illinois

LLO

Penn State

Stanford

TAMA

UTB

UWM

## May 6, 1999: topics

- **LIGO/LSC Algorithm Library (LLAL)**
- **Data Analysis White Paper**
- **Sathyaprakash (Cardiff) reported on Hierarchical Search code**
- **Active discussion: are Padé-approximants needed for high (~10 solar) mass objects?**
- **Anderson/Balasubramanian (UWM) reported on blind Time/Frequency code (gr-qc/9905023) to look for merger phase of ~50 solar mass objects.**

## May 6, 1999: topics (continued)

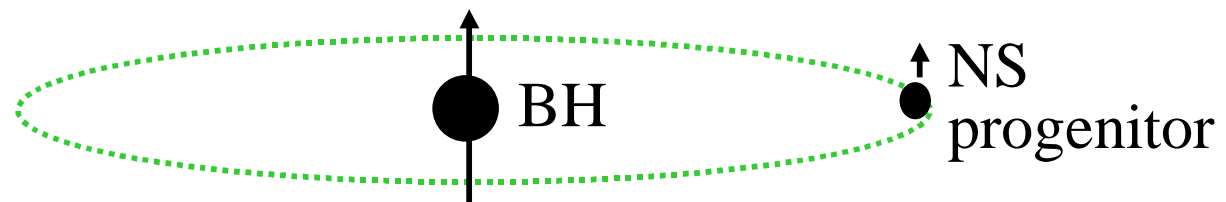
- **Takahiro Tanaka reported on TAMA hierarchical search code development.**
- **Tom Prince/Matt Evans reported on Moriond paper work NS/NS inspiral rate.**
- **Schutz/Papa reported on operation count for Hough hierarchical search method: “identical” to stack/slide method.**
- **Allen: PRL on 40-meter inspiral search finished (gr-qc/9903108) and submitted.**

## May 6, 1999: topics (continued)

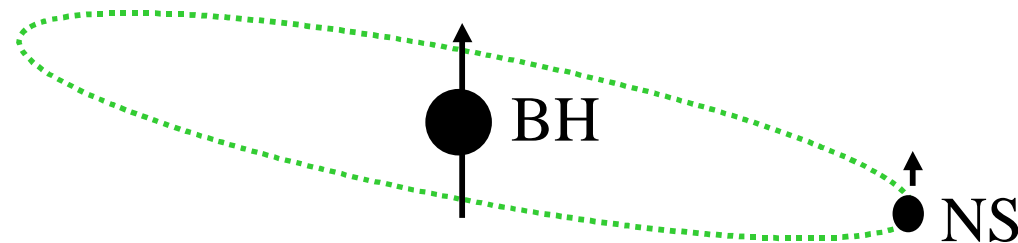
- **Joe Romano: comparison of the maximum likelihood and correlation techniques for stochastic background detection.**
- **Tom Prince/Walid Majid completed note on operations count for efficient frequency-domain chirp generation algorithm.**
- **Vicky Kalogera - spin orientation in binary systems.**

# Spin Orientation in Binary Systems

Before Neutron Star (NS) formation:



SN explosion “kick” forming NS tilts orbital plane:



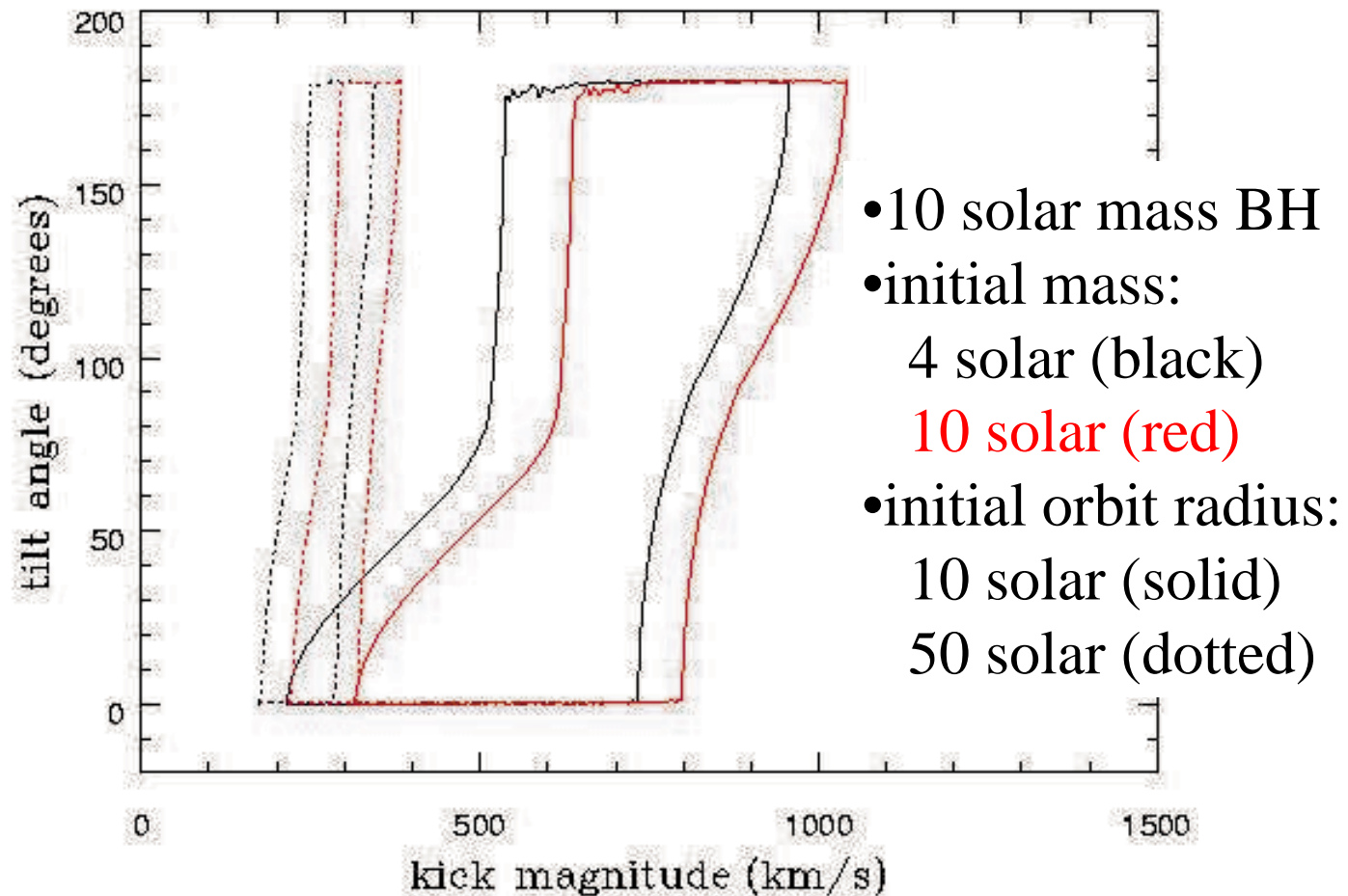
This effect modulates waveforms. It may dramatically increase size of filter template bank (Apostolatos) if tilt angles are  $> 30$  degrees.



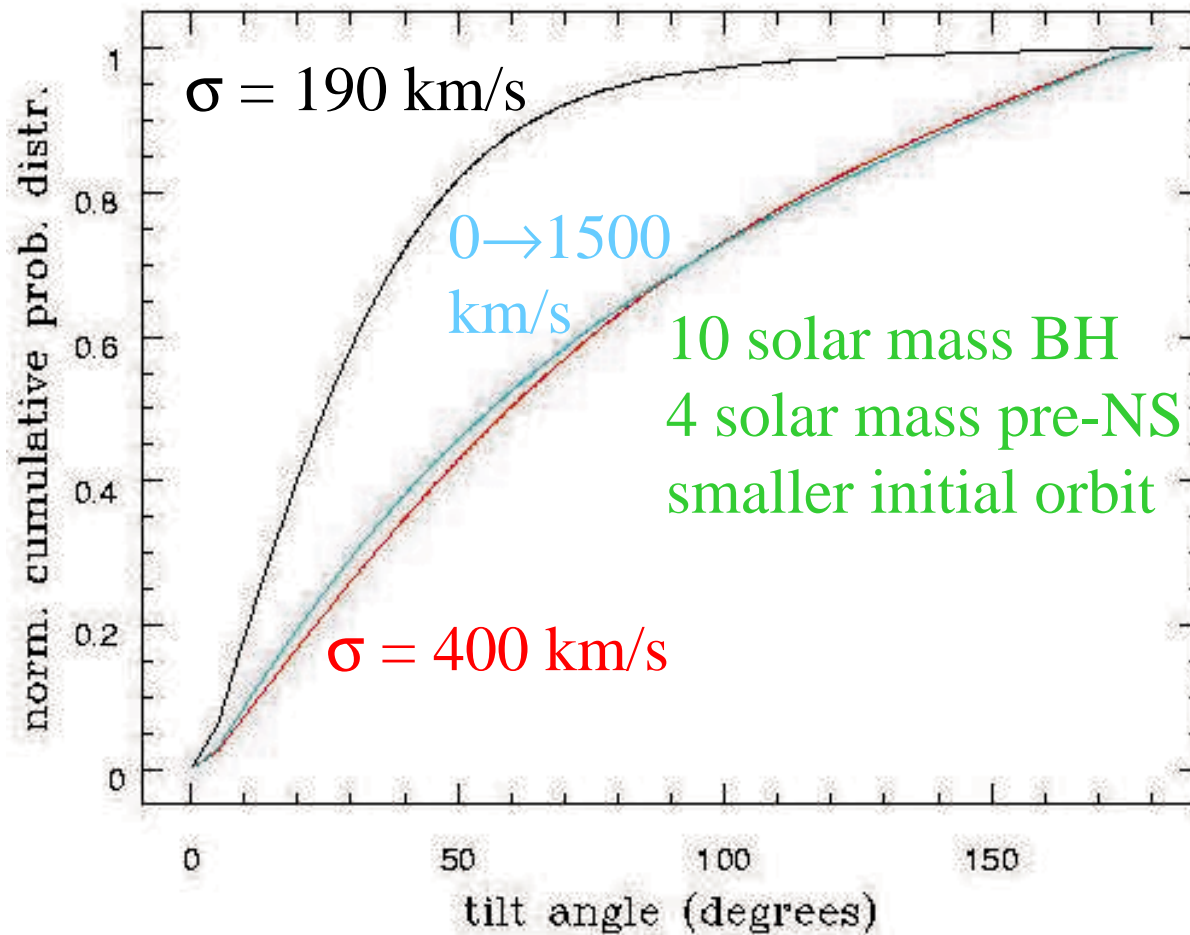
# Spin Orientation in Binary Systems

- **Problem: not enough ASIS group expertise to determine expected distribution of  $\theta$**
- **Approached Vicky Kalogera (CFA) for assistance in January 1999.**
- **Initial study completed May 99**

# Spin Orientation in Binary Systems



# Spin Orientation in Binary Systems



# June 7, 1999 Conference Call

- **18 people**
- **Groups represented:**

<b>AEI</b>	<b>Caltech</b>	<b>Florida</b>
<b>Illinois</b>	<b>LLO</b>	<b>Michigan</b>
<b>Penn State</b>	<b>UTB</b>	<b>UWM</b>

## June 7, 1999: topics

- **Discussed data tape formats for LSC/LIGO use:  
S. Anderson has made a table of alternatives.  
B. Evans also investigated this.**
- **Hughes reported on orbital code for particles falling into spinning BHs.  
Next step: include back-reaction?**

## June 7, 1999: topics

- **Additional discussion of LLAL (Algorithm library) style/format.**
- **Discussion of status of data analysis White Paper**

# July 13th, 1999 Meeting

- **About 30 people**
- **Groups represented:**

**AEI**

**Cornell**

**Illinois**

**Stanford**

**Cardiff**

**CFA**

**LLO**

**UTB**

**Caltech**

**Florida**

**Penn State**

**UWM**

## July 13th, 1999: topics

- **Vicky Kalogera described orbital-plane spin-tilt angle results. Discussion of assumptions & evolution of tilt angle**
- **Alberto Vecchio described his database of potentially interesting objects for CW searches**
- **Sathya: Padé-approximant status**



## July 13th, 1999: topics

- **S. Anderson & Cutler illustrated and discussed “TEMPO” package**
- **Detailed discussion of work breakdown tables in Section 4 of White Paper (Astrophysical Source Detection)**
- **Basic idea: lead group (LSC) and interested groups.**

## July 13th, 1999: topics

- **Lead Group takes *full* responsibility for delivering a particular item (example: directed pulsar search code).**
- **Interested groups are welcome to participate.**
- **Lead Group must be able to deliver item without outside assistance.**

# Data Tape Proposal

- Each LSC group supply own blank tapes (or pay media costs)
- Each LSC group may *request* up to **10** tapes each week (nominal 50 Gbytes). Prioritize 1 to 10.
- Guarantee: each group will *receive* at least **1** tape each week

## Data Tape Proposal (continued)

- **Data available depends upon epoch:**
  - During commissioning: data must come from on-site disk cache (random 24-hour period)
  - During science run: requests supplied from CACR archive with 2-week latency, but can come from any archived epoch
- **Until LDAS running, users can only get raw frames, not “reduced” data.**